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ARCHIVES OF OPHTHALMOLOGY

EDITED IN ENGLISH AND GERMAN

BY

DR. H. KNAPP

AND

DR. C. SCHWEIGGER

OF NEW YORK

OF BERLIN

IN CONJUNCTION WITH

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NOTICE TO OUR READERS.

In beginning the eleventh volume, the editors desire to state that the general plan and the form of the ARCHIVES has always remained the same, but from the fourth number of the previous volume (Dec., 1881) an important change has been introduced in the Report on the Progress of Ophthalmology. **While preserving its systematic arrangement, the report is now much more elaborate, and follows the original publications at a shorter interval.** For that purpose the number of collaborators has been increased and their work organized according to a definite plan. The whole range of the current ophthalmological literature has been divided for reviews as follows :

Dr. H. MAGNUS, lecturer at the University of Breslau (22 Tauentzien Strasse) :

1. *General Ophthalmological Literature* :
 - a.—Text-books (not abstracts, but notes pointing out what is new and characteristic).
 - b.—Monographs and papers on historical, statistical, and general subjects ; reports of societies and hospitals.
 - c.—Periodicals on our specialty (short notices of their character, time and place of publication, the titles of the original papers, with the names of their authors in brackets).
2. *General Pathology, Diagnosis, and Therapeutics*, including new instruments, apparatus, and remedies.
3. *Normal Anatomy and Physiology*, including color-blindness.

Archives of Ophthalmology.

Dr. C. HORSTMANN, lecturer at the University of Berlin (Potsdamer Strasse 4) :

1. *Anomalies of Refraction and Accommodation.*
2. *Eyelids.*
3. *Lachrymal Apparatus.*
4. *Muscles and Nerves.*
5. *Orbit and Adjacent Cavities.*
6. *Conjunctiva, Cornea, Sclerotic.*
7. *Injuries and Foreign Bodies of these parts.*

Dr. A. NIEDEN, of Bochum, Westphalia :

1. *Uveal Tract, including glaucoma.*
2. *Refracting Media, including the lens.*
3. *Retina and Optic Nerve.*
4. *Injuries and Foreign Bodies of these parts.*
5. *Ocular Affections in connection with general diseases.*

In order to obtain complete and recent reviews on the non-German ophthalmological literature, special reporters have been selected for different countries, who will send monthly abstracts of all local ophthalmological publications to Dr. C. Horstmann, of Berlin, the chief editor of the Report. Dr. Horstmann will distribute these abstracts among the German reporters according to the above plan, in order to preserve the systematic arrangement, which we think of paramount importance.

The special reporters are :

For America : Dr. SWAN M. BURNETT, 1215 I Street, Washington, D. C.

For Great Britain and Ireland : Mr. E. NETTLESHIP, 4 Wimpole Street, London, W.; Dr. C. E. FITZGERALD, 27 Upper Merion Street, Dublin.

For France and Belgium : Drs. E. MARCKWORT and P. VON MITTELSTÄDT, 10 Chaussée de Malines, Antwerp.

For Italy : Dr. DANTONE, Rome.

For Spain and Portugal : Dr. VAN DER LAAN, Lisbon.

For Russia : Prof. HIRSCHMANN, of Charkow.

For Scandinavia : Drs. OLE BULL and SCHIÖTZ, Christiania.

Notice.

In the interest of our readers, who are scattered over the whole world—and whom, like ourselves, we desire to keep informed of all advances in ophthalmology,—furthermore in their own interest, authors of ophthalmological works are requested to send reprints, duplicates of journals, or copies for reviewing, to one of the above-named reporters, or to the editors or publishers of the Archives, according to their convenience.

The abstracts of American ophthalmological literature no longer appear under a special head, but are embodied in the systematic Report. Text-books may be specially noticed.

The Report in No. 4, vol. x, comprises the literary productions during the first half, that of the present number those of the third quarter, of the year 1881. The Report of the last quarter of 1881 will appear in the June number, and it will, in future, be possible, also for the English edition, to let them appear still earlier.

The number of good papers offered us for publication has increased to such an extent that it is no longer possible to translate all of them unabridged. Whenever a German paper is condensed in the English version, or *vice versa*, it will be so stated. Should any one of our readers wish to recur to the original, the editors will always take pleasure in sending it for reference.

It is intended also to publish, under the heading of "Miscellaneous Notes," all kinds of professional news which specially concern the oculist, *e. g.*, appointments, honors, resignations, vacancies, new ophthalmic hospitals, opportunities for instruction, prize questions and essays, announcement of Society meetings, etc. Brief notices of this kind will be thankfully received by the editor.

Original papers of value from any source will, as heretofore, be welcome to the ARCHIVES, and are solicited.

H. KNAPP, M.D.

25 WEST 24TH STREET, NEW YORK.

ARCHIVES OF OPHTHALMOLOGY.

ON CROUP OF THE CONJUNCTIVA,
WITH REMARKS ON THE TREATMENT OF THE CONTAGIOUS
FORMS OF CONJUNCTIVAL INFLAMMATION.*

BY DR. H. KNAPP, OF NEW YORK.

THE observation of so-called extreme cases is sometimes required to throw our mind away from the track of familiar views into new channels of thinking. We then recognize the significance of certain manifestations, which we failed to appreciate so long as we noticed them only in low degrees of development. Such an extreme case from the common group of muco-purulent conjunctivitis, came under my care lately, and forced me to change my opinion on that kind of inflammation which several authors have described as croupous or membranous conjunctivitis. The case, briefly related, was as follows.

A boy, David Hanifin, 9 years old, was brought to my clinic from the St. Stephen's Home in New York on October 9, 1881. The nurse stated that, four weeks previously, he had caught the ophthalmia from which many of the children suffered. He had daily grown worse, and since one eye had become blind and the other had been affected soon after the first and in like manner, the sisters were afraid he might lose both eyes. They begged me to admit him to the hospital.

On examination I found the lids of both eyes red, lustrous, swollen, soft, not particularly painful to the touch; the palpebral conjunctiva of both eyes was swollen and covered with thick, coherent, white membranes, which were difficult to wipe away with a

* Read, in part, before the New York State Medical Society, Feb. 8, 1882.

sponge, leaving an uneven, dark-red, bleeding surface. The cornea of the right eye was absent and the defect filled up by the same kind of membrane, which, however, could not be wiped off. The cornea of the other eye was intact. There was a thin, puriform discharge, moderate in quantity. The boy's general health was good. I demonstrated the case to the students as a mild form of ophthalmo-blennorrhœa with well-marked membranous deposits, a typical specimen of what Arlt and some others had called croupous conjunctivitis. Such deposits, I remarked, were not uncommon in acute catarrhal and also in milder cases of purulent conjunctivitis, and that there was very little danger of corneal ulceration. The destruction of the right cornea in this case was peculiar and probably accidental, the boy stating that a week after the onset of the disease he had fallen with this eye against a stove. Our hospital at that time being filled with operative patients, we had neither the space to admit the little patient, nor could we spare the nurses to attend to him properly. I therefore told his nurse to take him back, apply iced compresses to his eyes day and night, and cleanse the eyes every half hour.

Under this treatment the case remained materially unchanged for ten weeks. The substance replacing the right cornea grew into a mushroom-like tumor, which I removed with scissors. It proved to be a granuloma of the iris, covered with a dense croupous membrane. The boy was brought to the clinic twice or three times a week; the detached membranes were replaced by others in a very short time, almost under our eyes; the next day they always were as thick as on the day previous. Careful tentative touching with a one-per-cent. solution of nitrate of silver, or with the sulphate of copper crystal, only aggravated the disease, as I was afraid it would. Resorcin, boracic acid, chlorate of potash, and carbonate of soda, which were brushed into the eye, showed no influence whatever on the morbid process.

Toward Christmas the formations of the membranes appeared diminished and the inflammation on the decline, the left cornea all the time having been perfectly intact. On Jan. 4th, however, after an absence of two weeks, the boy was brought again with the inflammation as intense as ever before, the centre of the left cornea with a dense white infiltration of five millimetres in diameter, the remainder of the cornea dull, the iris congested, no pupil visible, and sight reduced to perception of light. Atropia did not dilate the pupil. Now I took the poor boy to the hospital, where iced

•

compresses were applied to his lids day and night, the lids carefully cleansed every half hour, atropia instilled several times daily, and the membranes wiped off every day. The retro-tarsal folds were swollen, and had polypoid excrescences, which were cut off. The pain and burning in the eyes were at once relieved, the discharge diminished, and from the third day the periphery of the cornea began to clear up and the infiltration to absorb. The membranes became thinner, were more easily removed; soon they broke to pieces, reproduced themselves only in separate patches, and in three weeks had disappeared altogether. The discharge also lessened in proportion as the membranes diminished. In two weeks the pupil began to dilate, and having then become larger than the steadily contracting infiltrations of the cornea, the boy began to see again. When the formation of the membranes had ceased, the iced compresses were applied only an hour every morning, noon, and evening. The ocular conjunctiva had never shown any deposits. The palpebral conjunctiva, after the disappearance of the membranes, was still swollen, dark-red, and uneven, showing the condition which has been, improperly, described as papillary trachoma. Daily touchings with bluestone now had a good effect, and when I left New York, Feb. 6th, the lids were only moderately rough, the cornea had a small superficial opacity in its centre, the pupil was moderately dilated by atropia, and the vision about $\frac{20}{100}$. Another granuloma of the iris, this time free from croupous membranes, had formed in the right eye and was cut off; that eye is atrophic, but the other saved, as the disease is virtually over.¹

Besides this case I have seen only one other of equal gravity, in a boy of five years. There the disease also started in the right eye, but soon led to so high a degree of swelling of the palpebral conjunctivæ (which by their uneven and crevassed surfaces had the appearance of cauliflower excrescences), the muco-purulent discharge was so moderate, the ocular conjunctiva and cornea being unaffected, that I disregarded the importance of the croupous membranes and considered the disease as a proliferating form of muco-purulent inflammation of the conjunctiva palpebralis. The usual remedies, astringents, a one- or two-per-cent. solution of nitrate of silver, touching with the sulphate of copper crystal, were of no benefit whatever; the membranes,

¹ Its sight to-day, March 1st, is $\frac{20}{100}$, the cornea having cleared up in an unexpected degree. K.

detached one day, were reproduced in equal density the day after. The cauliflower excrescences became very large and had a fungoid appearance. Supposing that they were granulation tissue I destroyed them with the nitrate-of-silver stick as thoroughly as Hebra used to destroy lupus nodules. The next day the eschar was cast off and replaced by the same dense croupous membrane which always had been there before. I treated the boy as a dispensary patient with mild astringents and cold applications to be made several hours during the day. After this had gone on for 3 or 4 months, during which I had repeatedly cut off polypoid excrescences of the retro-tarsal fold, the boy discontinued attendance for a few weeks, but then came back with his right cornea completely destroyed. I took him to the hospital, treated him like a case of blennorrhœa with uninterrupted cold applications; in a few weeks the formation of the membranes ceased, and the left eye, which had had the same affection, though in a less degree, was saved.

Mild cases of this affection, gentlemen, are not infrequent. They begin under the form of acute catarrh or moderate blennorrhœa, but soon are distinguished by the formation of thin whitish membranes covering the palpebral portions of the conjunctiva. Under the ordinary treatment of astringents, cold applications, and careful cleansing they get well in from three to six weeks. Having seen so frequently that the membranes had no appreciable influence either on the gravity or the course of the disease, I did not consider them as an essential feature of the disease, and classified the cases mostly as acute catarrh, sometimes, when the discharge was more puriform than mucoid, as acute blennorrhœa.

C. S. BULL, in the third American edition of Soelberg-Wells' text-book, devotes fifteen lines to croupous conjunctivitis, in which he says: "This form has been regarded by some English and Continental authorities as a distinct variety of conjunctivitis, but there seems good reason to doubt this. * * * The treatment consists in stripping off the membrane and cauterizing the surface as in catarrhal or purulent conjunctivitis." H. D. NOYES,

in his recent treatise on the diseases of the eye (Wood's Standard Med. Library, 1881), devotes 1½ page to "*Croupous, or diphtheritic conjunctivitis*" (p. 168). Though he describes croup and diphtheria under the same title, he points out the principal distinction between the two forms of exudation, but also regards the croupous membrane as an unessential feature of muco-purulent ophthalmia.

I have changed my opinion on this subject and concur with *Arlt*,¹ *Stellwag*,² *Saemisch*,³ and *Wecker*⁴ who, especially *Saemisch*, give clear descriptions of the disease, and state that we have to consider croup as a distinct form of conjunctival inflammation. It differs from catarrh, blennorrhœa, and trachoma by the presence of the characteristic whitish membranes, and from diphtheria by several points which I beg leave specially to mention:

1. In diphtheria the lids are very stiff and hard; it is difficult or impossible to evert them; in croup the lids are supple and soft, and can be easily everted.

2. The diphtheritic lid is unusually hot and painful to the touch, whereas the croupous lid can be handled without causing much pain.

3. The diphtheritic exudations are continuous from the deposit on the surface through the superficial and deeper layers of the conjunctiva, whereas the croupous exudation is a surface deposit only.

4. The diphtheritic membrane cannot easily be removed but must be torn off with some force, leaving the subjacent tissue pale and ragged, whereas the croupous membrane can be wiped off as a whole, leaving the subjacent tissue dark-red, bleeding, and uneven—finely nodular.

5. The tissue of the diphtheritic lid when cut into is anæmic and has, in the developed cases, a white, lardaceous appearance, whereas the tissue of the croupous lid is highly congested and soft.

6. The diphtheritic process leads to mortification of the

¹ Text-book, 1st edit., 1851, p. 85, and his new text-book, *Klinische Darstellung der Krankheiten des Auges*, 1881, pp. 16-19.

² Text-book, 4th edition, 1870, p. 423.

³ *Graefe-Saemich's Handbuch*. Vol. iv, No. 1, pp. 94-101.

⁴ *Wecker-Landolt, Traité Complet d'Ophthalmol.*, 1878. Tome 1, p. 320.

invaded conjunctiva, the croupous process to proliferation and cauliflower or polypoid excrescences.

7. Diphtheria readily extends from the lids to the bulbar conjunctiva and the cornea, whereas croup is long limited to the lids, and only in the severest cases affects the cornea, and seems always to leave the scleral conjunctiva free.

Let me now trace a *short sketch* of the disease under consideration.

Croupous conjunctivitis begins with the symptoms of an acute catarrh or mild blennorrhœa, but soon characterizes itself by the deposition of whitish membranes on the retro-tarsal folds of both lids, extending toward the fornix of the conjunctiva and the free edge of the lids as far as the so-called papillary body is found. The membranes consist of coagulated fibrine enclosing lymphoid cells in varying quantities. They may cover the palpebral conjunctiva in patches only, or as continuous layers of 0.1 *mm.* to 1.5 *mm.* in thickness. They can be more or less easily wiped off, and are quickly reproduced. The surface from which they are detached is dark-red, easily bleeding, uneven, not ulcerous, but finely granular. The lid is moderately swollen, not very sensitive, and can be everted without much difficulty or pain. The discharge is sero-mucous, or sero-puriform, and moderate. The progress of the disease is marked by the uneven swelling of the papillary body passing over into proliferation, with the production of smaller and larger cauliflower and polypoid excrescences. The pseudo-membranes cover all these productions, dip into the depressions and crevasses of the proliferous conjunctiva, and cannot be detached without lacerating and tearing off portions of the conjunctiva, thus causing effusion of blood, which shows a high degree of coagulability. Croup, in contradistinction to diphtheria, seems never to affect the scleral conjunctiva, and only exceptionally the cornea, there producing ulcers. These ulcers may be superficial and disappear in a short time, or become more extensive, occupy and destroy the whole cornea. From their whitish aspect and firm, even surface, which is rather raised than depressed, I am inclined to believe that they

also are covered with a croupous deposit. Even in that stage they are capable of restitution, leaving an unexpectedly small corneal patch when compared with their former size and intense milky opacity. They are complicated with consecutive plastic iritis, which may get well without adhesions or pupillary obstruction.

Course.—The milder forms of the disease are not infrequent, the severe ones very rare. The characteristic croupous stage seems to follow the catarrhal initial symptoms in a few days, may last for one or several weeks, or from two to six months. When the membranes disappear, they get softer, thinner, and brittle; the discharge then is mucopurulent, but still moderate when compared with genuine blennorrhœa.

The *nature* of the disease consists in swelling and proliferation of the papillary body of the conjunctiva, and the formation of fibrinous pseudo-membranes, which are interspersed with lymphoid cells and deposited on the surface, without infiltrating the tissues of the lid.

Its *causes* are those of catarrh and blennorrhœa. The disease is contagious and mostly affects both eyes. A constitutional predisposition may, perhaps, be admitted, as the catarrho-blennorrhœic conjunctivitis which in asylums goes from one inmate to the other, only in a few assumes the croupous character. Croupous conjunctivitis, like pharyngolaryngeal croup, is prevalently a disease of childhood. Some patients have croup of the eye and throat simultaneously.

The *prognosis* on the whole is favorable, the disease showing no marked tendency to affect the cornea, and, unlike diphtheria, leading to no gangrene of the parts affected.

As to the *treatment* I can only concur with Arlt and Sæmisch, in advising to abstain from all kinds of irritant medication as long as the formation of the pseudo-membranes is still active. Uninterrupted application, day and night, of iced compresses to the lids, and careful washing away of the secretion with a soft sponge, dipped in a very weak solution of chloride of sodium, chlorate of potash, and the like, should be enforced so long as the inflammation is progressing or at its height. As soon as the swelling decreases and

the membranes break off, the cold applications may be limited to an hour every morning, noon, and evening, and gradually left off. Weak solutions of nitrate of silver then seem to be the best remedy, also mild touching with the sulphate of copper crystal acts beneficially. Saemisch thinks that in a few mild cases he has cut short the progress of the disease by dusting powder of sulphate of quinine on the affected conjunctiva. I have no experience on the use of quinine in this manner, and Saemisch himself warns us not to use it in severer cases, lest the powder, acting as a foreign body, stimulate the inflammation.

Mr. President, I beg to take this opportunity for making some remarks on the utility of methodical applications of cold in the severer forms of conjunctivitis and on the general management of these affections. They are all contagious, yet not in such a manner that an infection through micro-organisms or other substances floating in the air need be feared. Practically the disease is transmitted only by inoculation. Under proper care, the most virulent gonorrhœal or diphtheritic inflammation of one eye is never transmitted to the fellow eye, even if left open, a fact of which I have convinced myself by hundreds of cases treated in hospital or private practice. Under proper care? What is proper care? Gentlemen, proper care is two skilled and trusty nurses, the one for the day, the other for the night, who never leave the patient; further, a rational physician who is not too meddlesome a therapist. I speak now of ophthalmia neonatorum, blennorrhœic or gonorrhœic ophthalmia of the adult, of croupous and of diphtheritic ophthalmia, also of the acute stage or acute paroxysms of trachoma. The treatment of all these cases is the same, and amounts to this: *so long as the disease is on the increase or at its height—abstinence from all but indifferent local remedies, methodical and uninterrupted application of cold, and careful cleansing; in the stage of decline—the same treatment in a milder form; in torpid and protracted cases—astringents or mild caustics.*

The infant of three days and over, who has blennorrhœa, should have cold applications day and night by means of thin iced compresses which cover no more than his burning eyelids. Every fifteen to thirty minutes the lids should be gently separated and the secretion carefully washed out with a fine soft sponge, dipped in a very weak solution of common salt, chlorate of potash, and the like. Several sponges should always be at hand, kept in an abundance of pure water, so as to keep them perfectly clean. Gentlemen, there is no cleansing material equal in softness and efficiency to fine sponges. To see that they are free from infection is our business, and a very easy business it is, for among all the disinfectants there is one which unshaken has stood the test of time: abundance of water. There is no contagium that is not made harmless by sufficient dilution; contagia can all be drowned. As soon as the little sufferer shows the least tendency to open his eyes, he should be encouraged in his endeavors. Darken the room moderately, so that the influence of bright light does not make him shrink. The opening of the eye is beneficial in two ways: 1st., the movements of the lids beat the corrosive secretion out of the conjunctival sac; 2dly, they accelerate the circulation in the affected parts, thus diminishing congestion, stasis, and infiltration. We know that the venous circulation in the extremities of our body is materially favored, I mean mechanically assisted, by muscular action. When a child opens his eyes, the danger is over; only a relapse must not be allowed to occur. The iced applications have to be continued, until the swelling of the lids and the creamy character of the discharge have disappeared. Gentlemen, no child need lose its eyes from ophthalmia neonati, and no child does, if faithfully treated in the way just described. I unhesitatingly commit myself to this assertion, since the cases over which I had full control, terminated favorably, and they count, not by the dozen or hundred, but by the thousand. Other modes of treatment may be good—and there is no doubt that certain eyes escape destruction under all kinds of treatment—but the one pointed out is capable of saving them all, and only in

order not to be absolute I admit the restriction of saying, "almost all." But, gentlemen, great and incessant care is needed. Prophylactic measures, such as cleansing the vagina before and during delivery, and washing the child's eye with weak, so-called antiseptic solutions, of which nitrate of silver $\frac{1}{10} - \frac{1}{8}$ per cent. is the best, may be useful, and need only be mentioned.

I cannot speak with the same satisfaction of the results of the treatment of gonorrhoeic ophthalmia in adults, though the same plan of treatment, pursued with the same rigorousness and persistency, saves, as far as my experience goes, the great majority of cases. Slitting of the outer commissure, if there be great tension, is beneficial, but can almost always be avoided, since the cold keeps the swelling down. The proposition of Critchett, of London, to divide the upper lid in its centre, in order to save the cornea from destruction, need certainly not be adopted.

What good the application of cold may do in *croupous ophthalmia*, is exemplified by the two cases reported at the beginning of this paper.

In *diphtheria* of the conjunctiva I know of no more important remedy than the energetic and persistent application of cold. I cannot countenance the proposition of Mooren and Berlin, by warm applications to abridge the true diphtheritic stage and lead the process more quickly over into the less dangerous blennorrhoeic stage, since I am convinced that nothing is so powerful in diminishing the violence of this dreadful inflammation as cold, and I am afraid that warmth may temporarily increase it and favor destruction of the cornea. I have to differ from the statement of Dr. Noyes and others that diphtheria of the conjunctiva is a very rare disease in New York. My former assistant, Dr. Born, has taken notes of over 70 well-marked cases during the three years that he was house-surgeon at the Ophthalmic and Aural Institute. The great majority of those cases, as well as others in my private practice, were cured under the above plan of treatment, persistently carried out.

What good the same plan, though less rigorous, may do in severe cases of *trachoma*, few persons who have not wit-

nessed it would believe. A patient may go for months and even years to the dispensary, and there show the usual alternation of better and worse, till a new crop of granulations, or blindness from corneal opacity, compels him to enter the hospital. He is treated with iced compresses several hours during the day, is directed to dip his face into cold water, and is admonished by every moral effort, assisted, if necessary, by mechanical appliances, to hold his eyelids open as much as possible; his lids are touched with the sulphate of copper crystal, and the improvement in most cases is very marked, not to say astonishing. In the course of three or four months I have seen trachomatous lids restored to a healthy condition with scarcely perceptible cicatrices, and a trachomatous cornea through which fingers could not be counted, so much clear up that fine type could be read.

Gentlemen, what I have said is only a sketch, and, if I did not trespass on your time and indulgence, I would fain say more, for I am deeply impressed with the fact that among all questions in ophthalmogy—that of cataract perhaps excepted—there is none so important as the treatment of contagious ophthalmia.

THE CONDITION OF THE EYES IN TWO CASES OF FATAL ANÆMIA—AN ANATOMICAL INVESTIGATION.*

BY DR. BOERNE BETTMAN, OF CINCINNATI.

THE progressive pernicious anæmia, first described (1869¹) under this name by Biermer, must, notwithstanding the thorough clinical and anatomical researches which have since then been published, be still considered as a new and in certain respects as an unexplained picture of disease. Several clinical phenomena especially, which appear in the fundus of the eye, have received, from an anatomical standpoint, various and often contradictory interpretations. These reasons induced me to subject four eyes, which were kindly placed at my disposal by Prof. Becker, and which were taken from two cases of anæmia with fatal termination, to a more minute examination.

These investigations could be carried out more conscientiously and more accurately since all technical difficulties were overcome by the use of Calberla's mass modified by Ruge, and Thoma's sliding microtome. With these means I succeeded in laying numerous serial sections, of which the thickest had a diameter of $\frac{1}{80}$ mm., through the posterior segment of a half eyeball. The results of my investigations offer some points of interest, and serve as corroborations and enlargement of several appearances already explained; their communication may therefore appear justifiable.

* Made at the Pathological Institute of the University of Heidelberg.

¹ Eichhorst, Tagl. der 42. Versamml. Deutsch. Naturforscher und Aerzte in Dresden, 1868, No. 8, Sect. ix, p. 173.

The first case, of which the clinical history was kindly placed at my command by Prof. Friedreich, concerns a woman.

Bertha Fritz, aged 37, of Schriesheim, was admitted to the medical wards on June 14, 1880, with the diagnosis : pernicious anæmia. Before proceeding to the examination of the eyes, some remarks pertaining to the condition of the blood during the first and last examination may prove interesting. On the day of admission there were found in 1 *ccm.* blood

1,298,600 red blood corpuscles.
5,300 white “ “

R. : W. = 243 : 1

During every examination of the blood very many poikilocytes and numerous microcytes were found.

On July 16th the patient felt somewhat better. As no essential objective changes could be discovered she was dismissed, in compliance with her wish, but owing to an exacerbation of the affection, was readmitted on Aug. 18th.

The patient was now repeatedly examined, the blood appearing already macroscopically thin and of a pale color. Poikilocytes were found in great numbers, also many microcytes. Altogether a considerable decrease of the red corpuscles could be determined even without counting ; no approximation of the blood corpuscles so as to represent rolls of coin ; the white corpuscles did not appear to be increased.

At the last examination, taken on July 21st, 1 *ccm.* of blood contained

1,164,200 red corpuscles, and
4,800 white blood corpuscles.

The œdema in various parts of the body and the vomiting, symptoms which had appeared now and then during the first half of her abode in the hospital, increased in frequency, as did the other symptoms (dulness of the sensorium, a feeling of decrepitude, sense of weakness), during the latter part of her stay. Death ensued on Aug. 25th.

Condition of the eyes.—As assistant of the eye clinic, I had frequent opportunities to examine the patient, and did so for the first time on June 20th.

The patient did not complain of any disturbance of sight. An ophthalmoscopic examination showed the following conditions: Both papillæ were pale, the difference in the breadth of the vessels and in their color (bright red) was so slight, that I was enabled only after continued observation to distinguish the two circulatory systems, one from the other. The whole fundus appeared already at that time of a lighter color and paler than in the normal condition. A marked venous pulsation was observed on the papilla. On the 10th July a slight œdema of the lower lid and of the conjunctiva palpebræ, associated with an increased secretion of tears, made its appearance. These symptoms disappeared gradually, and were no longer noticeable on the 15th July. During this time the patient had complained of slight disturbances of vision, veiled sight. On examination the following conditions were noted: S $\frac{6}{4}$ —. E. J. No. 1. Lids of both eyes normal. Conjunctiva palp. strikingly pale. No œdema. Oc. d. Pupil dilated (homatropin). Ophth. appearance: Media of both eyes perfectly clear. Oc. d. Papilla very pale and somewhat obscured. The cloudiness spread over the whole retina, diminishing in intensity toward the periphery. Course of the veins tolerably normal. Difference in the color and breadth of the vessels same as in the foregoing examination. Many small retinal hemorrhages of various forms and sizes were visible between papilla and macula; some showed yellowish white centres.

Oc. sin. All the pathological appearances noticeable in the right eye were, with the exception of retinal cloudiness and hemorrhages, also found in this eye. The pulsation of the vein, which restricted itself to the papilla, could again be recognized, on this side only. Both eyes exhibited deep physiological excavations.

This examination took place on the day before the patient's discharge. After the second admission I examined her twice, and in fact shortly before her death. On the 28th, two days before the fatal issue, ophthalmoscopic examination by dilated pupil showed the following appearances:

In the right eye the majority of the hemorrhages between papilla and macula had disappeared, only a few with dot-like bright centres were visible in the neighborhood of the papilla. Small, ribbon-shaped hemorrhages, which had not existed at the time of the former examination, were now to be seen at the posterior pole of the eye, generally along a vessel; still no connection

of the hemorrhage with either of the systems of blood-vessels could be determined. The paleness of the papilla and cloudiness of the retina had increased. Oc. sin. The fundus oculi showed, with the exception of a slight cloudiness and a few punctiform hemorrhages, no essential changes. The venous pulsation on the papilla was apparent during this examination also. .

On August 24th, the day before death, entirely different conditions were observed in the left eye. The patient was so weak that she could not hold up her head. My examination was therefore connected with difficulties, but I was enabled, notwithstanding the necessarily hasty observations, to discern near the macula and papilla bright-red, band-like, also round extravasations of blood. The other appearances had undergone no real alterations. The right eye showed the same conditions as on August 23d.

Since the hemorrhages in the left eye appeared on August 23d, as punctiform ecchymoses and 20-24 hours afterward as ribbon-shaped hemorrhages, one might be inclined to bring them into close connection with the powerful acts of vomiting which occurred during the last few days of her life.¹

The anatomical diagnosis, extracted from the records of the Pathological Institute, reads as follows : "General anæmia of the organs, parenchymatous hepatitis, fatty degeneration of the muscles of the heart, catarrh of the stomach and intestines, red degeneration of the marrow of the bones."

Macroscopic condition. The eyes, which were perfectly normal as regards their form and size, were divided horizontally, after having been sufficiently hardened in Müller's fluid.

All the ocular tunics were well preserved, and presented, with the exclusion of the retina, normal conditions. In the fundus of both eyes only a few hemorrhages of different forms and sizes were to be seen. After pieces of the retina, which were to serve as teasing preparations, had been removed from one half of each eye, both halves were imbedded in Ruge's mass.

Microscopic examination. Oc. sin. The stump of the optic nerve, together with its enveloping membranes, was entirely normal. A serous transudation, which had accumulated in a great measure directly around the blood-vessels, pervaded the tissues of the papilla and the adjacent parts of the retina. This

¹ On August 19th patient had vomited several times ; on the 20th, 9 times ; on the 21st and 22d, once ; not at all on the 23d ; on the 24th, the day upon which the pronounced hemorrhages in the left eye were noticed, twice.

œdematous transudation was met with mostly in the inner (facing the vitreous) layers of the papilla. The central parts showed less participation, whilst that portion of the optic nerve within the choroidal ring and the surrounding parts remained perfectly unchanged. The nerve bundles and fibres were forced apart and partially macerated, thus producing larger and smaller cavities, some of which were empty, others filled with a finely granulated mass (transudation fluid coagulated by the preserving liquid) and with blood corpuscles scattered throughout the optic papilla. The sheathless nerves (axis-fibres) presented in different parts a slight degree of swelling; they presented partly a more uniform thickening, partly spindle-shaped varicosities of homogeneous appearance and of a faint, whitish lustre. These changes were very distinct at the margin of the papilla and could be traced for some distance into the retinal tissue.

The spaces between the supporting fibres, in the nerve-fibre layer, were enlarged near the papilla, and the fibres themselves greatly swollen; these changes were especially prominent in cross-sections of the fibres.

The nerve fibres and connective-tissue framework in the periphery of the retina showed not the slightest alterations.

The band-like and round sanguineous exudations, in the posterior pole of the eye, had their seat in the nerve-fibre and inner granular layers. The hemorrhages were well preserved, not the slightest trace of a retrograde metamorphosis being visible; a sign of their recent origin. Reference to the clinical history will show that these exudations occurred only 24-48 hours before death.

The hemorrhages were of very small size; thus, one of the largest, about 5 *mm.* to the inner side of the margin of the papilla, measured in its long diameter 0.408 *mm.* The changes in this part of the retina were quite interesting; the matter in question being a rupture of the *membrana limitans externa*.

The middle and external retinal layers were bulged outward, toward the chorioidea, and came gradually to a point, resembling thereby a section of a funnel, the deepest part of which corresponded to the perforated apex, whilst the base coincided with the inner border of the granular layer.

The nerve-fibre and ganglion-cell layers were but slightly arched and almost entirely free from blood corpuscles. The inner granular layer, owing to the hemorrhage which forced the granules apart, had increased quite materially in thickness from

0.0512 mm. to 0.0816 mm. The outer retinal layers were partly detached from the middle layers and forced into the torn perforation. The rods and cones were destroyed ; the ends of the torn limitans were directed outward, parallel to the axis of the funnel, and appeared at least as bright lines without an outer lining. The thickness of the retina in the axis of the funnel was 0.30612 mm.; the ends of the torn limitans had been separated by the wedged-in granules and blood corpuscles, to an extent of 0.0375 mm. Between retina and choroid I found small aggregations of red blood corpuscles ; many of these were carried by the imbedding mass, which made its way between the tissues, to a place distant from the torn limitans. The point of interest attached to this condition is the causation of the rupture by so small an accumulation of blood, this state of affairs being generally brought about by an extensive hemorrhage only.¹

In preparations of the other eye I noticed quite often that the hemorrhages reached the outer limitans, bulging it outward. The rupture of the limitans in the above-described preparations may also have been caused by the severe spells of vomiting. Other structural changes were not observed. The rods and cones, excepting at the above-mentioned locality, were well preserved ; pigment granules of the retinal pigment epithelium adhered to their external segments ; the retinal epithelium was connected with the choroid throughout its whole extent.

The retinal blood-vessels contained perhaps somewhat more blood than in the normal condition ; neither fatty degeneration nor other pathological changes could be recognized in their sharply defined walls ; neither did teasing preparations show any changes.

The choroid was connected to the sclerotic throughout its whole extent ; from the retina it was separated by the imbedding mass. The walls of the choroidal vessels exhibited no alterations. In surface preparations of the chorio-capillaris the vessels were turgid with blood. The blood corpuscles heaped themselves up in the spindle-shaped dilatations of the capillaries described by Sattler. The contour of the capillary walls was well defined ; nowhere (the dilatations were particularly examined) could I find a separation of continuity or any other pathological change. Com-

¹ Quinke found in one case (*Deutsches Archiv für klinische Medicin*, 1878) hemorrhages the size of a pin-head between choroid and retina, bulging the latter tissue inward, but he does not mention whether the hemorrhages came from the retina or choroid.

parison with normal preparations showed that the dilatations had increased somewhat in size. The contents of the blood-vessels consisted of all those peculiar forms of blood corpuscles found in pernicious anæmia,—abnormally large blood corpuscles, small globular bodies, so-called microcytes, blood corpuscles with and without a central depression, many of a biscuit form, others kidney-shaped, many with prolongations, and others of an extremely irregular form, as was already observed during life. Many white blood corpuscles, tinged dark blue by hæmatoxylin, were also noticed. The diameter of the largest red blood corpuscle measured 0.0095 *mm.*, only several of the white corpuscles exceeded the normal in size; the sclera was perfectly normal.

Oc. dex.—The optic nerve and its sheaths offered but slight pathological changes. The papilla showed, only in a few preparations, at its margin, slight alterations to be attributed to serous transudation.

Beyond the papillary margin the changes described in the first eye as dependent upon œdema of the nerve-fibre layer were quite marked.

These changes—enlargement of the spaces between the radial fibres, swelling of the connective tissue framework, accumulation of a finely granulated mass between the nerve fibres—had become in one locality of the retina so extensive, that they took upon themselves the character of a pronounced œdema of the retina, as described by Ivanoff (*Gr. Arch.*, Bd. xv, 2). Many small and large spaces, separated by the radial fibres, existed in the nerve-fibre layer; other larger oval ones, elongated in the direction of the thickness of the retina, lying next to each other, separated only by the hypertrophied radial fibres, occupied the intergranular and part of the inner and outer granular layers.

The ganglion cells and the molecular layer took part in the formation of the lower spaces. The thickness of the retina in the above-mentioned place amounted to 0.188 *mm.*; a normal part of the retina in the immediate neighborhood measured 0.109 *mm.* The majority of the spaces were empty, many contained a finely granulated mass.

The other changes which interest us particularly are the hemorrhages and the hypertrophied varicose nerve fibres described by Heinr. Müller. The sharply-defined hemorrhages had their seat most often in the nerve fibre and inner granular layers, less often in the ganglion-cell layer, and but seldom in the molecular and

outer nerve-fibre layers. Uthoff¹ found the hemorrhages most frequently in the nerve-fibre and intergranular layers, less often in the ganglion-cell layer; the granular layers were but seldom invaded. The relation of the hemorrhages to the various layers of the retina were, numerically expressed, as 9:2:1:8:2:1:2, the numbers corresponding to the various retinal layers, the first number to the inner, the sixth to the outer nerve-fibre layer.

In the nerve-fibre layer the hemorrhages followed the course of the nerves and larger blood-vessels, obtaining thereby a more ribbon-like shape, whilst in the remaining layers the blood-corpuscles forced a path along Müller's fibres, assuming a round or more irregular form. Above the papilla, between the same and the macula, small hemorrhagic infiltrations were found, which were composed only of red blood corpuscles, and showed in their centre no changes which might tend to explain the white spots seen with the ophthalmoscope. I am sorry to state that many of my sections through the upper half of this eye were lost; they no doubt contained the hemorrhages in question.²

The varicose nerve fibres were situated in the inner nerve-fibre layer, in the vicinity of the papilla. They appeared as aggregations, were observed only in particular localities of the retina, and manifested themselves in general as oval, dimly-shining bodies, at times with nuclear contents.

In those localities where they formed clusters they occupied the whole thickness of the nerve-fibre layer, without increasing the diameter of the retina; in other parts, where they were found more scanty, they appeared as spindle-form enlargements of the nerve fibres, which showed in their course two or three such thickenings.

¹ Uthoff, *Zeh. Monat. Bl.*, Dec., 1880.

² A few remarks relating to the imbedding method, with special reference to the removal of a large part of the vitreous, may be indicated here. Since the vitreous can never attain the consistency of the other tissues and the imbedding mass, I found it necessary, in order to give the different tunics of the eye—sclera, choroid, and retina—an equal support from both sides, to remove the vitreous, layer after layer, before placing the organ in the imbedding mass. This procedure, when carefully executed in well-hardened eyes, succeeds in every case without producing the least alteration in the position and relation of the ocular tunics.

It is, moreover, of great advantage to allow a thin layer of the vitreous to remain adherent to the retinal surface. The imbedding mass enters into an inseparable connection with the retina, and since the mass accepts the various tinctures, the inner border of the retina would become blended and inaccurate. This condition, as may be well conceived, is not brought about if the above-mentioned rules are complied with, since the thin and compressed layer of vitreous is not stained, at least not in the same degree as the retina, and is recognized as a bright line between retina and mass.

Iodine, with and without the addition of sulphuric acid, also the various acids alone, produced no reaction.

The varicosities reached in this case no particular thickness, but all stages of enlargement, from 0.00625–0.025 *mm.*, could be observed. The various tinctures, hæmatoxylin, carmin, eosin, Grenacher carmin, colored these enlargements hardly more than the nerve-fibre layer; still it occurred several times, as was also observed by Uthoff, that hæmatoxylin and carmin colored the nuclear bodies dark-blue and red.

The ganglion cells in the immediate neighborhood of the varicosities deviated not in the least from the normal condition.

Several of the larger retinal vessels were turgid with blood corpuscles.

Around the well-defined walls of the vessels, between them and the neighboring tissue, I found a finely granulated mass. In longitudinal sections of the blood-vessels a pronounced network, the spaces of which were likewise filled with a granular mass, was observed on both sides.

The nerve fibres and ganglion cells were forced somewhat aside, but not subjected to the slightest change. In cross-sections of several large vessels situated in the nerve-fibre, ganglion-cell, and inner granular layers, and whose lumina were entirely filled with granular degenerated blood corpuscles, a diffuse discoloration of the adjacent tissue was to be seen, especially distinct in the nerve-fibre layer. The walls of the vessels were well defined, and refracted the light strongly. The extremely thin wall of one vessel occupying the outer granular layer could not be followed all around, but showed in one place a somewhat diffuse appearance—a break in its continuity. An extensive hemorrhage situated above this vessel, bordering the latter, occupied the intergranular layer. The adjacent tissue had assumed the already-mentioned diffuse discoloration, which took its origin apparently from the indistinct part of the vessel and extended into the centre of the hemorrhage. These diffuse colored parts were found only about such vessels as were filled with degenerated blood corpuscles, and the walls of which presented the above-mentioned highly refractive power. Iodine and sulphuric acid did not produce the characteristic action for amyloid degeneration.

Minute changes could not be observed, owing to the diffuse coloration and the dull-shining appearance. The retina was

otherwise well preserved. Sections of the sclera and choroid presented only normal appearances. In surface preparations of the chorio-capillaris I observed conditions similar to those in the left eye. Not the slightest alterations in the walls of the blood-vessels were to be found in teasing preparations of the retina.

The diffuse discoloration found about the changed blood-vessels, and, as I wish right here to remark, in the middle of those hemorrhages in a state of degeneration of the still-to-be-discussed case, may be considered as a sign of a retrograde metamorphosis, the nature of which cannot be determined, for my preparations were all treated with alcohol, which dissolves, as is well known, all fatty substances ; the discoloration itself also prevented further investigations.

II.

For the short notes concerning this case I am indebted to the kindness of Dr. Brohm.

Jacob Bechtold, mason, aged 44, came under notice May 28, 1880. Patient took sick fourteen days before admission, after continued physical exertion. A feeling of general lassitude, dizziness, headaches, want of appetite, were the symptoms complained of. These symptoms increased, with the addition, eight days ago, of an attack of chills in the morning, followed by fever. On the day of admission there existed, besides these subjective symptoms, objective ones, which pointed to a pernicious anæmia : œdema, high degree of anæmia, heart-murmurs, bruits along the larger blood-vessels, retinal hemorrhages, poicilocytes, and decrease in the number of the red blood-corpuscles. The course of the disease up to June 10th was that of a pernicious anæmia. On this day the clinical appearances underwent a change. Bone symptoms appeared in the sternum. Pressure on the processus ensiformis caused severe pain. These symptoms disappeared gradually, and on June 16th the sternum was not sensitive to touch in any part. Spleen and liver, which were abnormally large at the date of admission, increased in size. Examination of the blood did not reveal an increase in the number of white blood corpuscles. On June 23d pains were again experienced in the centre of the sternum. From this day on, painful spots came under notice in the various bones of the body. Never, not even in the state of agony, five minutes before death, were nucleated blood corpuscles found.

The augmentation of the white blood corpuscles was observed for the first time on June 26th ; their rapid increase could be determined from day to day until death, which occurred on June 29th. Changes of the general symptoms were not produced by this altered blood condition.

Appearances of the eyes.—At the first examination a marked paleness of both papillæ, opacity of the retina, tortuosity of the retinal veins, and numerous retinal hemorrhages were found. In several of the round extravasations yellowish-white spots surrounded by a red border were noticed. Patient complained of no disturbance of vision. In the course of time processes of degeneration and absorption were observed in the hemorrhages. Besides these symptoms, circumscribed, irregular, white plaques of a dull lustre, similar to those described by Litten,¹ were seen. After existing for some time they would disappear only to return again.

This appearance was repeatedly observed and could be noticed during an interval of from 24–48 hours. These plaques were to be distinguished from those occurring in retinitis Brightii by their want of lustre and their more saturated gray color. These appearances had already been observed during the first period of the disease and underwent no material change during the latter half, corresponding in this and in many other respects with the well-known case of Litten. During the last few days the patient complained of a slight diminution of sight, especially when he assumed an upright position. The autopsy was made on June 30th, in the Pathological Institute.

Anatomical diagnosis.—Hyperplasia and green discoloration (chloroma) of the lymph glands of the mediastinum, and of the retrogastric and portal lymph glands. Parenchymatous hepatitis, tumor of the spleen, red metamorphosis and greenish discoloration of the marrow of the bones.

Macroscopic condition.—The eyes were removed a few hours after death and immediately placed in Müller's fluid. After sufficient hardening, Prof. Becker divided them into anterior and posterior halves. The latter parts were kindly given to me for microscopic examination.

Oc. sin.—The stump of the optic nerve presented a pronounced hydrops of its sheaths. Distributed throughout the retina were large and small hemorrhages, many of which showed yellowish

¹ Litten, *Berl. kl. Wochenschr.*, No. 20 u. 21, 1877.

white centres. With the unaided eye eighteen hemorrhages could be counted. The hemorrhages showed various forms ; most conspicuous of all were those with bright centres. Several of the latter, *ex. gr.*, above the macula and papilla, attained a diameter of 1 mm. These appearances became more distinct with the assistance of a strong magnifying glass. Irregularities of the retinal surface were now visible. The larger hemorrhages appeared as prominences ; small white elevations surrounded by a red border could also be observed. I made a faithful sketch of the macroscopic picture, paid especial attention to the position, size, and relation of the different changes to one another, as also to the macula and papilla. The drawing was of the greatest advantage to me during my examination, for I was thus enabled to assert that certain changes which I found in my preparations and which I, by their size and position, could compare with the macroscopic condition, were the anatomical bases of these appearances.

Oc. dex.—The changes in this eye were similar to those described in the left ; the white plaques appeared more numerous. A similar procedure with reference to the drawing was observed here also.

Microscopic examination. Oc. dex.—The stump of the optic nerve was perfectly normal, neither did the papilla offer any pathological changes. The deepest part of the physiological excavation was situated more to the outer side. The outer wall was flat, whilst the opposite side showed quite a steep elevation ; the larger blood-vessels ascended this side. Signs of a serous transudation were quite marked in some parts of the retina, especially near the papilla ; in the periphery these changes were wanting altogether. The hemorrhagic exudations were met with principally in the nerve-fibre layer ; the well-preserved blood corpuscles did not, as in the other case, follow the course of the nerve fibres, but arranged themselves close to and above each other in the direction of the radial fibres, acquiring thereby a columnar appearance. In the ganglion-cell layer these columns divided, forming arches which in turn sent out prolongations ; these extended through the retina and bulged the external limitans outward.

The so-called varicose nerve fibres¹ appeared in great numbers and in a pronounced form. They formed large nests which projected into the vitreous. The form of the several varicosities in these nests was irregular owing to the pressure exercised upon

¹ Heinrich Müller's gesammelte und hinterlassene Schriften zur Anatomie und Physiologie des Auges, p. 299.

each other. The surrounding retina showed normal conditions, with the exception of a slight œdema of the nerve-fibre layer.

I never succeeded in finding, like Uthoff, two or more nuclear bodies in one varicosity, but convinced myself by fine focussing that, in those few preparations in which this seemed to be the case, this appearance was due rather to oblique sections and to the juxtaposition, in the first place, of two nuclear bodies belonging to two adjacent varicosities.

The average size of the varicosities was larger than in case Fritz (0.005-0.0625 *mm*). The largest diameter of a nuclear body was 0.0125 *mm*. The nucleus of a large ganglion cell in this part of the retina had a diameter of 0.009375 *mm*.; the cell itself measured 0.0218 *mm*. The various coloring agents stained the varicosities deeper than in the foregoing case, perhaps because the nuclear bodies (which accepted more of the coloring matter than the remaining part of the varicosity) were larger.

The application of iodine and the acids produced, as in case Fritz, a negative result. The walls of the blood-vessels were well marked; changes similar to those described in the right eye, case Fritz, were not observed, neither did teasing preparations demonstrate pathological changes in the walls of the blood-vessels. Sections of the choroid and sclera showed these tissues to be normal. In surface preparations of the chorio-capillaris I observed, besides those appearances already mentioned in case Fritz, a great number of irregularly formed blood corpuscles, of from 0.002574 to 0.0159 *mm*. in diameter. A nucleus was plainly visible in the majority of cases; in many, two and three were to be seen; in some, the nucleus completely filled the cell, so that only some finely granulated protoplasm was apparent in the periphery. The phenomenon of division of the nucleus could be observed in all its stages in the large cells. The difference with reference to the contents of the blood-vessels in both cases was marked.

The white corpuscles in case Fritz did not appear in such number and size as in this case, neither were the phenomena of cell division observed. The pale-red blood corpuscles reached a size of 0.0095 *mm*.; the white corpuscles in case Fritz seldom exceeded the normal dimensions; in case Bechtold their diameter often amounted to 0.0519 *mm*.

Oc. sin.—The optic nerve and papilla appeared in every respect as in the right eye. Œdema of the nerve-fibre layer was most pronounced in the vicinity of the papilla; the serous transudation

in both these eyes was more equally distributed than in case Fritz.

The hemorrhages could be classified under three heads : namely, such as were composed mostly of red blood corpuscles ; others which resembled the above in form and size, differing from them only in the accumulation in their centres of colorless cells ; and, at last, such as were situated between the limitans interna and the nerve-fibre layer, taking upon themselves egg-shaped forms and projecting into the vitreous humor. Since the first-mentioned hemorrhages offer no points of distinction from those described in case Fritz, they deserve no further notice.

The second form corresponds to the oft-mentioned ophthalmoscopic picture of a well-circumscribed hemorrhage with a yellowish-white centre. I made quite a number of sections, whose diameter never exceeded $\frac{1}{8}$ mm., through such hemorrhages. I found in these preparations, which (to judge from the length of the hemorrhages and of the central accumulation of cells, and by means of comparison with the other sections) corresponded to the border of the extravasation, a large, well-circumscribed accumulation of red blood corpuscles, in the centre of which a number of various-sized and formed cells were collected together. The cells had been colored blue by hæmatoxylin, and corresponded in form and size—0.00274–0.01137 mm.—with those filling the adjoining blood-vessels.

The central, tolerably well-circumscribed accumulation of cells lay nearer the inner border of the hemorrhage, and was separated from the limitans interna by a layer composed of from 6–10 rows of well-preserved red blood corpuscles. The length of this hemorrhage was 0.918 mm., the greatest thickness 0.518 mm., the diameter of the accumulated lymphoid cells 0.0612 mm.

A second preparation, which, owing to an increase in the diameter of the central part of the hemorrhage (length of hemorrhage 1.0204 mm., diameter of the collection of cells 0.0816 mm.), seemed to correspond to a part of the hemorrhage nearer the centre, showed entirely different conditions.

Only several rows of degenerated red blood corpuscles lay between the limitans interna and the centre of the extravasation, which consisted mostly of metamorphosed colorless cells, amongst which were several that still accepted the coloring matter. The whole had assumed a diffuse discoloration.

In other sections which came from the centre of these white

spots (length of hemorrhage 1.0204 *mm.*, thickness 0.153 *mm.*, diameter of central part larger than in the above-mentioned cuts) the appearances of degeneration were more marked. The broken-down cells were arranged close to one another, and occupied almost the entire thickness of the hemorrhage, which participated in this retrograde metamorphosis to a higher degree than in the last-described serial cuts.

The same dull, blurred appearance mentioned above followed the application of the various tinctures, the interpretation of which has already been given.

Coarse, large structural changes were not noticed. Isolated varicose nerve fibres were met with in the hemorrhages, but never in their centre. In other sections I found clusters of varicose nerve fibres, surrounded by a border of well-preserved blood corpuscles, which in number stood in no relation to those encircling the accumulation of lymphoid cells. In another part of the retina, in the nerve-fibre layer, there existed a diffuse colored spot, surrounded by several degenerated blood corpuscles. This spot of 0.1 *mm.* diameter, in the periphery of which the nerve fibres appeared indistinct, I consider as an almost entirely absorbed hemorrhage with secondary structural changes.

The third form of hemorrhages, namely, such between limitans and nerve-fibre layer, appeared in two localities: in the macula lutea and somewhat below and externally to this part. The latter hemorrhage, which extended partly into the nerve-fibre layer, or originated from this part of the retina, showed in this layer a granular degeneration of the blood corpuscles and other appearances of a morbid nature.

The thickness of this hemorrhage amounted to 0.306 *mm.*, and it projected 0.2 *mm.* beyond the level of the retina. The hemorrhage in the macula had, owing to the formation of retinal folds, become detached from the ganglion-cell layer, and differed from the above-mentioned hemorrhagic exudation only by the absence of all secondary processes.

The varicose nerve fibres showed appearances similar in every respect to those in the other eye. The changes in the walls of the larger blood-vessels corresponded to those found in the right eye (case Fritz), but were less marked. The walls of many were extremely thin and reflected the light strongly, the lumen was turgid with degenerated blood corpuscles. The tissue about the blood-vessels exhibited the oft-mentioned washed and blurred ap-

pearance. The network encircling the larger blood-vessels in the nerve-fibre layer, as described in case Fritz, appeared in this eye also. Sclera, choroidea, and surface preparations of the latter tunic exhibited the same conditions as in the right eye.

Remarks.—A review of the foregoing will demonstrate that the essential pathological alterations are: changes in the walls of the blood-vessels, œdema of the nerve-fibre layer, and formation of hemorrhages and varicose nerve fibres. With reference to changes in the blood-vessels it has been shown that in one eye of both cases marked changes in the walls of the vessels were to be observed.

I could not, like Biermer, demonstrate fatty degeneration nor any other change in the walls of the retinal capillaries. Neither did Quinke,¹ Litten, Müller,² Eichhorst,³ Uthoff succeed in discovering pathological appearances in these vessels. The distensions, aneurysmatic enlargements of the retinal capillaries described by Manz,⁴ Nykamp,⁵ and Eichhorst, were not found.

In the surface preparations of the chorio-capillaris I found the distensions unusually filled with blood corpuscles. Comparison with normal preparations showed that although their number had not increased, they had become somewhat larger in size.

Both preparations (normal and pathological) came from the periphery of the choroid, as was to be inferred from the length of the meshes.

¹ Quinke, *Sammlung klinischer Vorträge*, herausgegeben von Richard Volkmann, No. 100.

² Herm. Müller, *Die progressive perniciöse Anämie, nach Beobachtungen auf der medic. Klinik in Zürich*, 1877.

³ *Die progressive perniciöse Anämie. Eine klinische und kritische Untersuchung von Dr. Herm. Eichhorst*, 1878, p. 272.

⁴ *Centralbl. der med. Wissenschaft.*, 1876. p. 675.

⁵ *Berl. klin. Wochenschr.*, No. 9, 1877.

Manz found in the microscopic examination of one eye, in which hemorrhages with bright centres had been seen with the ophthalmoscope, ampulla-like distensions of the retinal capillary walls. These distensions were partly empty and partly filled with colored and colorless cells; he left it undecided whether only the lymph-sheath or also the wall of the vessel participates in the aneurysmatic distensions.

Eichhorst, who had met with similar appearances in the examination of two eyes, succeeded in proving in osmium preparations that the lymph-sheath only becomes distended, the wall of the blood-vessel having previously been torn through.

In those eyes which showed microscopic changes of the blood-vessels, the alterations in the fundus were first observed, as reference to the clinical history will show; the ophthalmoscopic changes observed in the other eyes, especially in the left eye of case Fritz, appeared at a later period, and in a lesser degree, as is proven by the microscopic description. I am therefore disposed to bring all the phenomena (œdema, hemorrhage, varicosities of the nerve fibres) into close connection with the disease of the blood-vessels, and in such a manner that the degree of the pathological appearances is to be considered as dependent upon the degree of the changes in the blood-vessels.

The changes called forth by serous transudation were more or less pronounced in all the eyes, especially marked in the vicinity of the papilla, where they were most distinctly recognized with the ophthalmoscope under the form of retinal cloudiness. Only in the left eye (case Fritz) did the above-mentioned changes, forcing apart and maceration of the nerve fibres, appear in the papilla also. In the right eye, on the contrary, in which the pathological process had lasted longer, the œdema was not confined to the nerve-fibre layer alone, but the other layers of the retina took part in this process and produced a total œdema of this tissue.

The repeated appearance and disappearance of the retinal cloudiness was observed with the ophthalmoscope. Microscopically, none, or only very slight, changes due to serous transudation could be established in various parts of the retina, especially in the periphery, of the different eyes, whilst the ophthalmoscope showed a cloudiness of the retina in its entire extent (as I convinced myself in case Fritz a few days before death). It is therefore to be accepted that the serous transudation in the just alluded to unchanged retinal parts was either of a slight degree or of short duration, producing therefore no visible changes. The narrow network, with fine granulated contents, about the larger retinal blood-vessels in the inner nerve-fibre layer appeared in all eyes, most distinct in those preparations striking the long diameter of the vessels. These al-

terations remind one of the changes described by Iwanoff as œdema about the veins in the nerve-fibre layer, with destruction of the surrounding tissue, and may, perhaps, be therefore viewed as the first stage of this process.

The round and ribbon-shaped hemorrhages appeared in all eyes, especially numerous at the posterior pole. The latter form of exudation constituted the main factor of disease in the left eye (case Fritz); in the other eyes the hemorrhages contained in their centre those yellowish white spots which may originate in the following manner.

1. By the accumulation of well preserved lymphoid cells in the middle of the hemorrhage. These cell aggregations were not surrounded by a distinct envelope, as Manz found in his case, but were in immediate contact with the surrounding hemorrhage, into which they often sent prolongations. The diameter, 0.06—0.09 *mm.*, of the collection of cells corresponds exactly with the statements of Manz.

2. By degeneration (retrograde metamorphosis) of the above-mentioned cluster of lymphoid cells and surrounding blood corpuscles, combined with secondary structural changes.

3. By the presence of large clusters of varicose nerve fibres in the centre of the hemorrhages.

Another question which must now be considered pertains to the mode of origin of the hemorrhages. Manz beholds in the aneurysmatic distensions described by him the various stages of development of the hemorrhages. Eichhorst found similar changes in the retinal capillaries, and arrived at the same conclusions. But since the third eye, which he examined exhibited no changes in the walls of the blood-vessels, the origin of the hemorrhages existing in this eye was attributed to diapedesis.

Nykamp found in one eye blood corpuscles between lymph-sheath and the walls of the blood-vessels, also small clusters composed of but several blood corpuscles in the vicinity of the vessels. These appearances he also ascribes to a diapedesis. Herman Müller could not demonstrate any alterations in the blood-vessels; Litten found in one

case destruction of tissue, which he believes must therefore be attributed to changes in the blood-vessels (rhexis), because such alterations are not wont to follow a diapedesis. In those cases where changes in the blood-vessels are absent, he and Müller think that the matter in question is a functional disturbance, a greater fragility of the blood-vessels, due to a variation in the mixture of the blood.

Marked changes in the blood-vessels appeared in one eye of each case. In the left eye (case Fritz) a large hemorrhage composed of thickly clustered blood corpuscles was situated above and in contact with the altered blood-vessel, just at the locality where the wall of the latter was unrecognizable; appearances of degeneration extended from this part of the vessel into the hemorrhage. In the right eye (case Bechtold) there existed, besides changes in the blood-vessels, two large hemorrhages between the inner nerve-fibre layer and membrana limitans interna. Reference to the clinical history will show that those ribbon-shaped hemorrhages in the left eye (case Fritz) originated quite suddenly, and were produced most likely by the violent acts of vomiting. These facts, combined with the evidence of degeneration of the walls of the blood-vessels point with certainty to rupture (rhexis) of the walls of the blood-vessels as the cause of the hemorrhages. Those hemorrhages, on the other hand, which were composed of blood-corpuscles arranged above and next to each other, forming arcades and arches between which the unchanged nerve and Müller's fibres stood out quite prominently, also those small isolated clusters of blood corpuscles in the various retinal layers (Oc. dex., case Fritz), indicate a diapedesis. We believe, therefore, that the hemorrhages were caused by both methods.

The varicose nerve fibres were found more or less developed in all eyes. Those homogeneous thickenings of the nerve fibres, as found on the papilla and in the retina of the left eye (case Fritz), were already considered by Heinr. Müller¹ and Roth² as the first stage in the development of the varicose nerve fibres, whilst those varicosities with glob-

¹ *L. c.*

² *Virchow's Arch.*, Bd. lv, p. 197.

ular nuclear contents (called "ganglioform hypertrophy" by Roth) were looked upon as the last stage of their formation. Although these varicosities have been observed in many forms of retinitis, and their presence in pernicious anæmia was *a priori* to be surmised, they were but lately found in this particular form of disease by Uthoff. He found them most often isolated, but also several times in the centre of hemorrhages, and considers them, in part, as the anatomical foundation of yellowish white spots observed in the hemorrhages. In case Bechtold I observed several hemorrhages whose centres were composed exclusively of large clusters of varicose nerve fibres, and can, therefore, confirm the statements of Uthoff.

Besides these yellowish-white spots, due to the aggregation of varicose nerve fibres, we have still to discuss the white plaques which were observed in three of the eyes, and consist, according to Litten, often only of a collection of white blood corpuscles. Occasionally varicose nerve fibres are also to be found in the plaques. "They are composed, according to my opinion, not exclusively of varicose nerve fibres; these accompany rather only occasionally the accumulation of leucocytes."

Litten assumes that in those cases where varicose nerve fibres alone were found, the white corpuscles which had existed were absorbed, and therefore not found at the microscopic examination. Those cases in which the yellow spots are seen with the ophthalmoscope gradually to decrease in size, point, according to his opinion, to this proceeding.

Since I found in both cases, especially in case Bechtold, numerous clusters of varicose nerve fibres, in the vicinity of which the retina in many cases showed, with the exception of a slight degree of serous transudations, normal conditions, and since I never found varicose nerve fibres in the aggregation of cells in the centre of the hemorrhages, I cannot join in with the opinion of Litten, and believe I must affirm that the white plaques, at least in my cases, were composed exclusively of varicose nerve fibres.

The retrograde hemorrhage, with still visible secondary

structural changes in the left eye (case Bechtold), might also have presented ophthalmoscopically the appearance of a white spot. According to my observations, there was no direct connection between the hemorrhages and the varicosities; I found the latter but rarely within the hemorrhages, and then only isolated and in the periphery. In the left eye (case Fritz) they appeared in the papilla and bordering parts of the nerve-fibre layer, which remained free from hemorrhages. In the right eye (case Bechtold) the varicose fibres were so numerous that they formed the chief factor of the pathological changes, the hemorrhages existing in a comparatively slight degree.

The formation of hemorrhages about the clusters of varicose nerve fibres I seldom observed. As the size of the sanguineous exudation stood in no proportion to the diameter of the aggregation of varicose nerve fibres, and as the hemorrhages had formed but around a few of the numerous clusters, it is to be accepted that they had a secondary origin, and that a corresponding appearance may be observed with the ophthalmoscope, namely, the gradual formation of a red border around a white spot.

It is not my intention to enter into details as to the manner of origin of the varicose nerve fibres; the various theories having been compiled by Roth, *l. c.* I wish only to call attention to the direct connection between the varicosities of the nerve fibres and the serous transudation in the nerve-fibre layer, which appeared as a constant phenomenon in the 4 eyes. Roth found varicose nerve fibres in 35 cases of different forms of retinitis, which led him to the conclusion that "the varicose nerve fibres are a more or less marked accompanying symptom of an inflammatory process depending upon a local or general cause." That a cloudiness of the retina, which appears microscopically as an œdema of the nerve-fibre layer, exists to a greater or less degree in every inflammation of the retina, requires no further confirmation.

We have already learned from the clinical history that the œdema made its appearance at first in the right and afterward in the left eye; in the latter case we found the

first stages of development of varicose nerve fibres in the papilla and surrounding parts of the retina. In the right eye, where the serous transudation had operated for a longer period and appeared in a more marked degree, as is to be inferred from the microscopic condition (structural changes, œdema of the retina), the varicosities appeared more developed and numerous; many possessed already a nuclear body.

In case Bechtold, where the disease had lasted longer and the serous transudation appeared more equalized in both eyes than in case Fritz, the varicosities had reached their highest stage of development. I call into requisition the discovery of Rumpf, who found that the action of lymph upon the nerve fibres produces swelling of the latter, in order more fully to explain the minute changes arising through the action of the serous transudation upon the nerve fibres.

It is a pleasant duty at the end of these investigations to thank Prof. Arnold for the support proffered me during the course of my examinations.

A CASE OF QUININE AMAUROSIS MANIFEST- ING ITSELF PRIMARILY IN ONE EYE ONLY.

By C. M. HOBBY, M.D., IOWA CITY, IA.

Aug. 6, 1881.—Miss M. S., aged 21, was brought to me by a physician of a neighboring town with the following history.

Some weeks previously the patient suffered from very severe left supra-orbital neuralgia ; subsequently what was supposed to be episcleritis of the left eye occurred, accompanied by conjunctival injection and œdema of the eyelids. The neuralgia being considered malarial in character, was treated with large doses of quinine, and fomentations of belladonna were applied to the eye. Under this treatment the paroxysms of pain diminished in frequency, and the conjunctival and subconjunctival injection disappeared. *Very large doses of quinine were required to produce cinchonism.* No belladonna had been used during the preceding week.

At the time the patient came under my observation, she presented an anæmic appearance, had very little appetite, and was still suffering from occasional attacks of neuralgia. There was no injection of the conjunctiva or sclerotic ; the right eye was apparently normal ; in the left eye the pupil was widely dilated and not appreciably affected by light. $ODS = \frac{x^6}{xxxii}$; $OSS = \frac{3}{cc}$. No improvement obtainable by glasses.

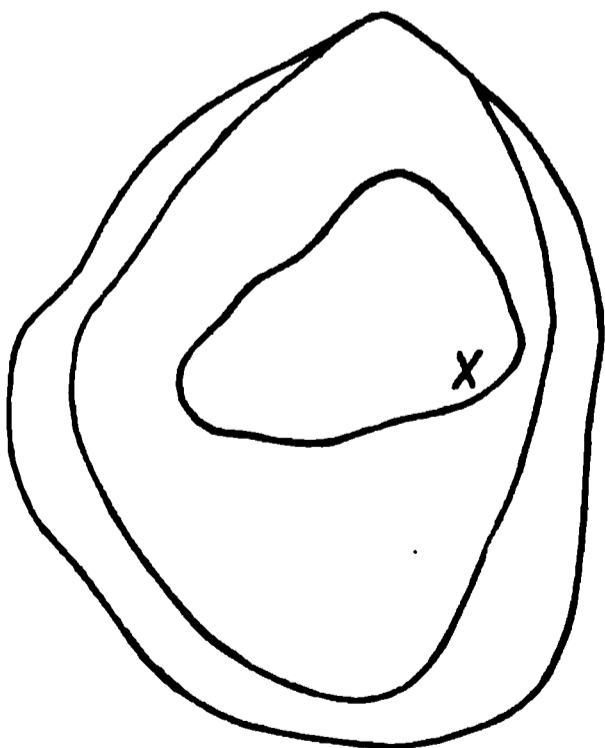
Ophthalmoscopic examination showed intense ischæmia of *both retinæ*. No test of visual field was made at this time.

I retained the patient under observation, unable to make a satisfactory diagnosis. In order to determine how much the dilatation of the left pupil was due to the former use of belladonna, I instilled a drop of a one-half-per-cent solution of eserine.

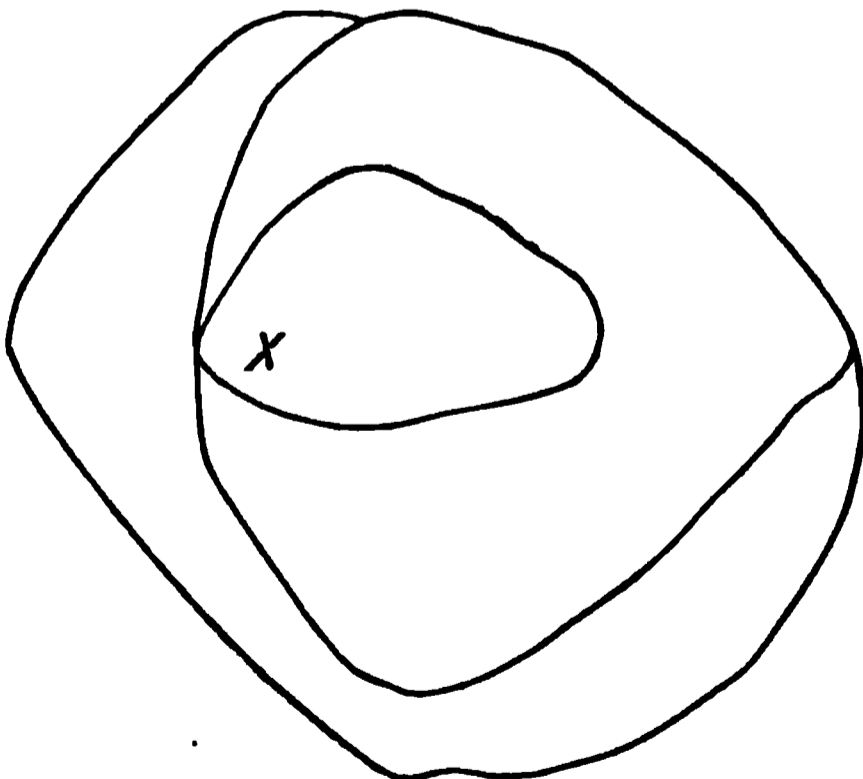
On the next day the pupil had nearly returned to its normal dimensions, and the acuteness of vision had increased to $\frac{15}{\text{cxxxvii}}$. The patient's vision continued to improve for the next nine days, when S was $\frac{16}{\text{xx}}$ for both eyes. During that time she had received only indifferent medication. At this time, the neuralgia becoming prominent and markedly periodical, I ordered her twenty grains of quinine, to be taken in two doses, one hour apart. The next morning she felt much better. The acuteness of vision being as before, she was permitted to return home.

On the fourth day following (Aug. 20th) she returned with both pupils dilated to the utmost. O D S = $\frac{16}{\text{cc}}$; O S S = $\frac{3}{\text{cc}}$. At this time she reported that the left eye began to get worse upon her return home, but she noticed no trouble with the right eye until the previous day. The visual field was now examined (by using black objects on white paper), and found reduced in both eyes to about one tenth of the normal. Ophthalmoscopic examination showed profound ischæmia of both retinae. Recognizing the probable existence of "quinine amaurosis," I commenced the use of strychnia hypodermically, increasing the quantity each time until the physiological effects were apparent. The improvement was rapid, and in ten days the acuteness of vision had returned to $\frac{16}{\text{xx}}$ for both eyes, and the visual field of each had doubled. During the use of strychnia the malarial symptoms disappeared and the general physical condition improved. She was then directed to use a ferruginous tonic and discharged. Six weeks later I found the acuteness of vision unchanged and the

O. S.



O. D.



visual field much increased in extent, but still less than half the normal.

The accompanying figures show the gradual extension of the visual fields, their limits having been determined on Aug. 20th, Aug. 30th, and Nov. 15th.

The inference to be drawn from this case would seem to be that the toxic effect of quinia may primarily manifest itself in a *single eye*.

THREE CASES OF HYDROPTHALMUS TREATED WITH IRIDECTOMY.

By H. DERBY, M.D., OF BOSTON.

CASES of hydrophthalmus, cornea globosa, are as rare as they are unpromising. In the records of twenty years' practice I found but five instances of this disease. The only treatment seriously proposed has been iridectomy; and the encouragement to the performance of this operation has been given on grounds that are mainly theoretical. Instances of its performance have rarely been published. In his monograph on the subject,¹ written in 1869, Muralt states that he is not aware of any results having yet been recorded, and gives, himself, the notes of a single case. He admits that the operation in this disease attended by unusual danger as regards healing and the chance of hemorrhage. And Schmidt, writing in 1877,² says: "The secondary glaucoma which complicates cornea globosa (hydrophthalmus congenitus) offers a poor prognosis for iridectomy. Besides the danger of cyclitis, which may be easily excited by this operation, there are perilous possibilities of purulent infiltration of the vitreous or of choroidal hemorrhages. When in these cases the rapid increase of intra-ocular pressure renders some kind of action necessary, it is best to try the effect of repeated paracentesis, which is certainly freer from danger."

My notes of the three following cases will therefore possess some interest.

¹ Über Hydrophthalmus Congenitus. Zürich, 1869, p. 50.

² Graefe-Saemisch, *Handbuch der gesamten Augenheilkunde*, vol. 5, p. 136.

CASE 1.—Bridget N., æt. 22, consulted me in February, 1865. Her vision began to be impaired at the age of eight, and a year later a perceptible change in the appearance of each eye had taken place. Fourteen months previously, sight having steadily failed up to that time, she had come to me at the infirmary. The notes of the case had been mislaid, all that could be ascertained being the fact that the case was one of pronounced hydrophthalmus in each eye, the right being the worse, and retaining only quantitative perception of light. A broad iridectomy had been made upward at that time on the right eye.

She now reported the right eye to have steadily improved and the left to have as regularly fallen off ever since the operation.

Each eye was found abnormally large and full, cornea 7'' in diameter and highly anæsthetic. + T 2 in each eye.

Right eye (which had been operated on) had a clear cornea, dilated and motionless pupil, and transparent media. Deep glaucomatous excavation of optic entrance, which was white, and the vessels of which were small. Sees moving hand in 13'.

Left eye.—Ciliary vessels congested, cornea very hazy, pupil dilated and fixed. Quantitative perception of light.

Iridectomy on left eye was performed Feb. 23d, much hemorrhage occurring. Considerable pain followed the operation, and lasted a month or more. Nov. 29th, of that year, the media were found clear and the optic entrance deeply excavated. She could see the motions of the hand seven feet away. With the right eye a single letter of 200 was made out in a foot.

A year later she wrote me that improvement had continued. She was working in a mill, and earning \$30 a month.

Nov, 9, 1870.—Vision continued improved until two and a half years ago, then began to fall off, and work had to be given up. Ever since it had slowly failed, though of late the change had been very slight.

Eyes looked much as before, media continuing clear, and tension the same. With the right eye 200 could be made out in 3'; visual field much contracted up and out. With the left the hand was seen moving in 1'.

CASE 2.—L. H., æt. 22, came to me Jan. 4, 1866. There are in his family six boys and two girls. Half of each have hydrophthalmus, two brothers and one sister being wholly blind. According to his account, the disease comes on in early childhood, the eyes rapidly enlarge, and ultimately rupture during some straining effort or from the effects of a blow.

[I have subsequently ascertained that this disease was unknown in his family before the present generation. No child of any brother or sister (whether blind or seeing) has shown any form of disease of the eye. The parents are still living, perfectly healthy, and with excellent eyes; are not related to each other.]

In his own case the disease has steadily increased since birth, the right eye being the more affected. The left eye retained the power of reading up to the age of 12. Two years ago an ophthalmic surgeon did iridectomy on the right eye. The excision of iris was large and well up to the ciliary edge, but the patient did not keep sufficiently still after the operation, and a severe and painful inflammation followed, lasting several weeks. As regards sight the eye is reported to be neither better nor worse than before the operation. It is now very prominent, + T 2, cornea 6" in diameter, enormous anterior chamber, media clear, no excavation of optic entrance. Doubtful quantitative perception of light.

Left eye is less prominent + T 2, cornea $5\frac{1}{2}$ " in diameter. Pupil dilated and fixed. Very large anterior chamber. Deep excavation of optic entrance. V $\frac{1}{8}$ with $-\frac{1}{8}$. He states, with great positiveness, that this continues steadily to fail.

A large iridectomy was done on this eye the next day. The wound did not close for five days, and the eye remained irritable, and at times acutely painful, for a month.

The operation was followed by a distinct stoppage of the failure of vision, indeed by some temporary improvement. In 1870 he was reported to be able to go about alone and to read the titles of books. His vision was then $\frac{1}{8}$. There was a slight cystoid cicatrix at the inner extremity of the wound.

Dec. 13, 1881.—I saw him once more, nearly sixteen years after the operation. The eyes were unchanged in appearance. He reported a steady diminution, for a few years past, in the area of the visual field, and in acuteness of vision. This was, however, very slow. He could now see the motions of a hand three metres away (nearly ten feet). This was one of his "bad days," there being times when he was confident he saw much better. He is a person of unusual intelligence, and is positive that he would not have retained his sight so long had it not been for the operation. He is now 38 years of age. Both his brothers and his sister were entirely blind before 17.

CASE 3.—H. C., æt. 20, came to me April 12, 1870. His father became blind at the age of 25. Of 11 children, 4 are also blind. Vision has generally begun to fail at about 14, the first symptom

being blur on use, followed by watering, rainbow colors, and gradual loss of sight, without pain. A sister, who comes with him, presents in her right eye the usual signs of hydrophthalmus. The other eye has atrophied, having previously ruptured. Another has in one eye a cataract, and no perception of light ; in the other, a partial cataract and entire optic-nerve atrophy. Patient himself has been losing sight ever since February, having been able to teach school up to that time. Rainbow colors are seen whenever a flame is regarded. Each cornea is large and each anterior chamber abnormally deep, the disease being evidently in an early stage. Tension is increased in the right eye, normal in the left. There are, on each side, a glaucomatous excavation and an arterial pulse. Vision $\frac{1}{8}$ in either eye. Each field of vision contracted, especially down and in. No corneal anæsthesia.

April 26th.—I did iridectomy on the right eye, and, one month later, on the left. Each eye healed readily, without pain. The arterial pulse at once ceased. As the patient had been warned, vision fell off immediately after the operation, in the right eye to $\frac{1}{8}$, in the left to $\frac{1}{8}$. It subsequently returned in full ; in 1872 had diminished to $\frac{1}{16}$ in each eye, and has never varied since. The visual field retains its previous limits, and the disease, in short, seems definitely arrested. I saw the patient last in November, 1881, eleven years after the operation.

As was stated in the outset, the disease is very rare. Operations for its relief are, however, so much rarer, and so infrequently reported, that the cases here cited may well serve as a basis for generalization. They show that iridectomy, undertaken at a late stage of the affection, is liable to be complicated by hemorrhage, and to leave the eye in a state of chronic and painful irritation. But it cannot be denied that the disease is arrested, and that an amount of vision, that was rapidly becoming extinct, is spread over a series of years, to the great comfort of the patient. Case 1 had already lasted 14 years, and there was distinct optic-nerve atrophy at the time of the operation. Case 2 at least 10. In both, the beneficial effect of the iridectomy is indisputable. Case 3 was taken in an early stage, and the disease at once stayed. Eleven years have elapsed and no progress is manifest. I feel, therefore, justified in dissenting from the writer in *Graefe-Saemisch*, and in advising iridectomy.

EXTRACTION OF FOREIGN BODIES FROM THE IRIS.

By J. L. THOMPSON, OF INDIANAPOLIS, IND.

IN the December number of the ARCHIVES OF OPHTHALMOLOGY, vol. x, No. 4, Dr. Hirschberg, of Berlin, in his article on the extraction of chips of iron and steel from the interior of the eye, quotes from the *London Lancet* as follows :

“ On May 18, '59, a girl, æt. fourteen, was brought to St. Mary's Hospital, under the care of Mr. White Cooper. The previous day, whilst standing near her father, who was turning a piece of hardened iron in a lathe, a chip struck her left eye, which had since been in constant pain, though the sight was not materially affected. The chip was seen sticking in the iris, almost midway between its upper border and the pupil. The anterior chamber was full, and there was no mark of entrance in the cornea. * * * Mr. White Cooper, fearing that difficulty would arise in grasping the smooth metal with forceps, suspended as it was in the loose membrane, decided on trying the effect of a magnet. The iris having been brought under the influence of atropine, whereby the foreign body was drawn near the margin of the cornea, the patient was chloroformed, and a cataract knife was passed through the cornea opposite the chip, and a sufficient opening made for its escape. A magnet was then applied to the wound, and in an instant the chip leaped from its situation in the eye and attached itself to the magnet. * * * The eye was well in a week.”

To the majority of the readers of the ARCHIVES, doubtless, the report of this case without comment will do no

harm, but to the inexperienced it is likely to work immense mischief, by causing them to use atropine in similar cases, and though the result was good in the above-reported case, yet we think that the end by no means justified the means used. The following case will show what dangers attach to the use of a mydriatic where foreign bodies lie in the anterior chamber.

W. F., æt. 40, came to me in 1875, two days after the receipt of an injury to his right eye while hammering the iron hoop from a paint-keg with the blade of a hatchet ; a small piece of either the hoop or the hatchet flew into the eye, passing through the cornea and lodging in the stroma of the inner-lower portion of the iris, midway between the ciliary and pupillary margins. The corneal wound had entirely healed, leaving scarcely a trace of opacity. His vision was good and he suffered but little pain. I proposed removing it, with probably a small portion of the iris, but he went off, promising to return shortly. I saw nothing of him for two days more, when he presented himself again, with the iris fully dilated and the body forced into the lens. I asked him how he came to use the atropine, and he replied that he had been reading Gunn's Domestic Medicine. A well-marked opacity of a portion of the lens so obscured the metal that it could not be seen. Of course I did nothing further than to watch and wait for further developments. The last time I saw him, which was about two months after the injury, the lens was almost totally cataractous, with no inflammation remaining. He then passed from under my notice.

In the above case, by sacrificing a very small portion of the iris he could have been given useful vision, and probably even without said sacrifice, but after the use of the atropine the body was forced through the delicate iris, the lens wounded, and now, of course, if any thing is done it must be the removal of the lens,—a very questionable operation where the other eye is not aphakial.

How would atropine have acted in the following case?

White, Joseph, æt. 28, a stone-cutter, was wounded while dressing a stone with hammer and chisel, Jan. 31, '80. He immediately went to a "Surgical Institute" where, he says, they worked

on him every day until he called upon me on Jan. 5, '81, when I found a foreign body lodged on the upper pupillary margin of the iris, about three fourths of it upon the iris and the remainder hanging over and into the pupil. I placed him under chloroform, made a section of the cornea at its junction with the sclerotic, and removed the body, with a small portion of the iris, without any difficulty whatever, before the class at our city hospital. The operation was made on Saturday, and he read in the presence of the class on the following Wednesday. Now, had one used a mydriatic in his case, the body would as surely have been stripped off of the iris and against the lens, as was the foreign body forced through the iris in the case above mentioned.

I have simply reported the two cases to show the danger of the use of atropine where bodies are embedded in the iris. Many others, where percussion-caps and pieces of iron have been so placed, have I, as well as all other eye-surgeons of experience, had to do with, but their mention in detail would be unprofitable and superfluous.

RUPTURE OF THE EYEBALL IN ITS POSTERIOR HEMISPHERE FROM A BLOW IN THE FACE.

By JULIAN J. CHISOLM, M.D., OF BALTIMORE.

THE two cases of recent occurrence which I here report, although novel in my personal experience, would not have had publicity beyond the staff of the Presbyterian Eye and Ear Charity Hospital, before whom the diagnosis was made and verified after extirpation of the destroyed eyeballs, had I not found in a recent work on "Injuries of the Eye," by Ferdinand Von Arlt, a recognized authority on such matters, the following passage. I make the quotation from a translation of the German work by Dr. Chas. S. Turnbull—an American publication. A paragraph on page 37, reads as follows: "*Cases of rupture of the sclerotic are not rare. Such rents extend without exception to the ciliary body, even through it. Of ruptures in the posterior sclerotic area, only one case is recorded (by Bowman), and here the rupture was not recognized until after the eyeball had been enucleated.*" From the same work I make extracts from pages 22 and 23: "When a foreign body impinges against the eye with a certain degree of sudden force, and, on account of certain physical properties, such as size, bluntness, etc., can not perforate its tunics, it expends this force by contusing the surface against which it strikes, or it causes either flattenings or indentations, the degree or extent of which depend on the character of the injuring surface, while, in the moment of injury, perhaps, no movement of the eyeball, as a whole, takes place. Now, an indentation or a flattening of the eyeball can not plausibly

be considered possible, unless the same also changes its form *in toto*. Suppose we consider the point attacked as the pole, and the direction of the attacking force as the axis of a sphere, then the equator of the latter must become longer at the moment of the injury. Any resistance at the opposite wall, especially if distributed over an extensive area, will only serve to increase this change of form. The occurrence of a gap in such a wall, or of a projection upon it, will, when the globe is pressed against, produce a localized bulging—in the former case corresponding in shape and dimensions to the gap, and in the latter to an indentation or perforation of the sclerotic; *but such conditions hardly, if ever, occur.*"

"Sclerotic rupture is of *rare or non-occurrence* in those very localities where choroidal rents are most frequent." Again, from page 27: "The constant parallelism of the sclerotic rent to the corneal margin has an additional reason in the histological fact, that the fibres of the sclerotic coat run parallel to the latter within the confines of the ciliary region." Again, at page 38: "The sclerotic rent is linear, or slightly arched, more or less serrated, and usually runs parallel to the limbus cornea, at a distance of from 2 to 5 millimetres from the latter. In one case only (Schroeter, *Klinische Monatsblätter*, 1866, p. 248) did the rent run at an acute angle."

The following extract is made from a standard work on "Eye Injuries," by George Lawson, F.R.C.S.: "The split in the sclerotic is almost invariably near the margin of the cornea."

CASE 1.—N. L., aged 27, was struck in the left eye with a chair during a drunken broil. He was knocked down insensible, and had his nose and brow badly cut. When he came to himself he was taken home. In the meantime the eyeball had become very prominent from swelling. He complained of great pain in it, and also of loss of sight. He was brought to the Presbyterian Eye and Ear Charity Hospital for treatment on the day after the accident. I found the eyeball very protruding, with lids much swollen and firmly stretched over the projecting ball which was half exposed. The conjunctiva was much discolored with blood extrava-

sation, and was chemosed in a heavy fold parallel with the free border of the lower lid. When the lids were drawn apart the eyeball protruded so conspicuously as to show the whole anterior half of the sphere, and presented the condition known as paraphymosis of the eyelids. When thus exposed, the whole front of the eyeball was entire, apparently without any injury to its outer walls. The anterior chamber was full of blood, and there was no perception of light. I was induced to palpate the eye and found its tension decidedly minus. It was so soft that the cornea could be corrugated, a condition that could not exist in connection with the intra-ocular hemorrhage without a giving way of the eyeball and the escape of some of its contents. Upon this diminished tension and excessive blood extravasation, with great prominence of the eyeball, I diagnosed laceration of the posterior hemisphere of the sclerotic. To prevent future suffering, I advised enucleation, which operation was satisfactorily effected under chloroform. After making the conjunctival section around the cornea, the opening of the capsule of Tenon to reach the tendon of the external rectus muscle allowed the escape of a quantity of dark fluid blood and indicated the location of the scleral opening, which an examination of the eyeball after its removal confirmed. The rent, which was a large flap, opening in the outer wall of the sclerotic, was located in the posterior hemisphere of the eyeball between the insertions of the external rectus and the oblique muscles. The source of hemorrhage was choroidal. The blood, after filling the eyeball and displacing the lens and vitreous body, which had escaped through the sclerotic rent, had freely effused itself into the orbital space, and by excessive infiltration had caused the extrusion of the eyeball.

This was the first case that I had ever diagnosed, in the absence of any visible wound, as posterior laceration of the sclerotic coat of the eyeball, and I was surprised at the facility with which the diagnosis could be made. The eyeball, full of blood, with excessive extravasation under the conjunctiva, accompanied by marked minus tension, made the diagnosis very positive of escape of some of the eye contents through a wound concealed from view.

I had been very much surprised on previous occasions at the amount of bleeding which could take place from a sclero-choroidal wound. In one, a case in which the eyeball had

been perforated by a fragment of iron over the insertion of the superior rectus muscle, I had much difficulty in checking the profuse bleeding from the wound, which saturated thick compresses. I was therefore quite prepared for the excessive extravasation in this case. The accident just reported, of posterior scleral laceration, was from a blow received through the lid upon the elastic eyeball, resulting in the giving way of the eye-coats at a point nearly opposite to that upon which the blow fell; clearly a case of laceration by counter stroke, and at a point where the eyeball is well supported by muscles as well as by the fatty cushion of the socket.

This accident was the sequel of a christmas frolic. In accordance with the experience of every surgeon who finds rare cases running in company, the day after New Year another case of eye injury nearly similar in its results was brought to the hospital dispensary for treatment.

CASE 2.—J. F., aged 23, was wounded in the right eye under the following peculiar circumstances. He and a friend were discharging pistols at a mark. While the patient was loading his revolver his companion, standing near him, fired at a stone lying on the ground some ten feet in front of them. With the report of the pistol the injured man cried out that he had been shot, which remark caused much merriment, from the apparent impossibility of such an accident, as the shot had been fired away from him. Blood was seen, however, upon his face, oozing from a wound in the upper lid. The eye immediately commenced to swell. He complained of great pain, and said that his sight was knocked out. I saw him the day after the accident. The eyeball was very prominent with excessive ecchymosis of the conjunctiva, and with the anterior chamber full of blood. The pistol-ball in rebounding backward from the stone had struck the lid, but not with force enough to penetrate. The skin of the upper lid only was broken, and from it the blood had escaped. The eyelids were much stretched over the protruding eyeball, and a fold of discolored, chemosed conjunctival tissue seemed to fill up the palpebral cleft. I elevated the lid upon a retractor and found that there was no wound in the front of the eyeball, and yet upon palpation I found the tension very much diminished, so that I could corrugate the cornea. With the case of a week before fresh in memory, I

did not hesitate to make the diagnosis of posterior rupture of the sclerotic coat of the eyeball, and recommended immediate extirpation of the destroyed and painful organ, as the quickest means of obtaining relief from suffering, and safety for the other eye. Under chloroform the eye was enucleated. The eye-shell was found full of coagulated blood. Its normal contents had escaped through a large rent in the upper part of the ball, which opening extended backward from the insertion of the superior rectus tendon. The tendon of the muscle restricted the laceration to the posterior hemisphere of the eyeball and prevented the wound from being seen when the eye was examined before operation.

The laceration seemed to have started from the point of the eyeball upon which the blow impinged, and had extended directly backward. An explanation for this rare accident may be found in the fact that when the injury was received the wounded man was loading his pistol and was looking down toward his hand. He, therefore, had not only the eyeball well covered by the upper lid, but in the extreme downward movement of the eye a large part of the upper hemisphere was rotated forward and exposed to receive the blow. The pistol-ball must have been somewhat spent, as it only broke the skin of the lid ; but the blow was sufficiently sudden and sharp to indent the eyeball to splitting, and thereby make the rent through which the contents of the eye were projected into the socket and incarcerated within the cone of muscles.

These two cases, while rare accidents, at least as far as the establishing of a diagnosis is concerned, differ in the immediate cause of the rent. In the first case the laceration in the eye-coat was not in a portion of the eyeball brought immediately under the influence of the blow. When the man was struck in the face by the chair, the bruised temple, brow, and nose indicated that the blow was received directly across the eye, upon its front, through the medium of the lids. The common seat of laceration near the corneo-scleral juncture did not yield, although this was nearest to the surface receiving the blow. When the sudden flattening of the eyeball took place the rent occurred near the opposite pole of the eye to the one impinged upon. In the second case the rent started at the point receiving the blow, and extended backward in the direction of the posterior pole and at right angles to the so-called constant circular laceration around the corneal periphery.

SERIOUS EFFECT OF CALOMEL UPON THE EYE.

BY F. C. HOTZ, M.D., OF CHICAGO,

OPHTHAL. SURGEON TO ILL. CHAR. EYE AND EAR INFIRMARY.

In November a railroad employé, aged 38 years, consulted me for an affection of his right eye, which resembled in every feature an extensive burn of the ocular conjunctiva. The eyelids were red and swollen, especially the upper one, so much so, that the eye could be opened but very little. The conjunctiva of both lids was very red, succulent, and roughened by enlarged papillæ. The retro-tarsal portions of the conjunctiva protruded in two thick, succulent folds when the lids were everted; and the ocular conjunctiva was also intensely red and swollen, so that its limbus projected considerably over the surface of the cornea. But what attracted my attention the most was a large white crescent in the lower half of the ocular conjunctiva; its convex border reached down to the lower retro-tarsal fold; its concave border was parallel to, and about 4 *mm.* from the margin of the cornea. The horns of this crescent extended upward around the sides of the cornea, and, tapering off gradually, terminated in sharp points in the upper half of the eyeball. The surface of the crescent was markedly depressed below the level of the surrounding conjunctiva, and exhibited the whitish, dry, bloodless appearance of mortified tissue, which we usually find after a severe burn of the conjunctiva.

The lustre and transparency of the cornea were not disturbed; the iris, however, was discolored, the pupil was contracted, and dilated very irregularly under the influence of atropia, on account of numerous fine synechiæ.

Upon inquiring into the origin of this peculiar affection, I re-

ceived the following information: The patient's habits always had been very regular; he never had gonorrhœa or syphilis; and never had sore eyes. The present trouble began two weeks ago, without any known cause, with swelling of the eyelids, redness of the eyeball, photophobia, profuse lachrymation, and some pain in and about the eye. He took some medicine internally (which, according to the prescription, contained quinine and morphine); but no medical application of any kind was made to the eye until two days ago. On that day his physician prescribed powdered calomel, which the patient's wife dusted into his eye by means of a camel's-hair brush. He could not say how much calomel was thrown in the eye; but the application caused considerable pain, increased the flow of tears, and the tumefaction of the lids; and on the next morning his wife discovered on the eyeball a large white patch which, as she very positively asserted, was not there when she applied the powder on the preceding day.

Under proper treatment the iritis subsided quickly, and, after the elimination of the eschar, the extensive defect in the ocular conjunctiva was closed by cicatrization. At the expiration of three weeks the eye had recovered a normal appearance, with a regular and mobile pupil; the only evidence of the past trouble was a callous white scar in the ocular conjunctiva, below the cornea, with linear extensions around the sides of the cornea.

Remarks.—From the history of this case it is evident that originally the trouble was an acute iritis, with an unusual degree of chemosis. Upon a grave error in the diagnosis, calomel was prescribed, and its local application was followed by the lesion in the ocular conjunctiva so directly that the existence of a causal relation seems very probable. If the patient had been taking iodide of potassium, there would have been nothing remarkable in the unusually violent action of the calomel; for we know that under these circumstances it is converted into iodide and bichloride of mercury. But as the patient had taken only a quinine mixture, I suspected the calomel was not chemically pure, the more so, as it was not obtained of a first-class drug-store. The chemist who examined the calomel for me reported the presence of considerable free hydrochloric acid; and to my further question as to the chemical changes such calomel

might possibly suffer in contact with the lachrymal fluid, he replied that at the temperature of the human body chloride of sodium can convert a little calomel into bichloride of mercury, and that this alteration is greatly favored by the presence of free hydrochloric acid. The production of corrosive sublimate, of course, explains the caustic effect. When the calomel was dusted in the eye, I think the cornea was probably turned upward, and the powder was sprinkled upon the lower portion of the chemotic ocular conjunctiva, and afterward rubbed into it by the pressure and movements of the swollen eyelids. This would account for the fact that the cornea escaped unscorched, and that the caustic action was most severe upon the more dependent portion of the ocular conjunctiva.

TWO CASES OF MALIGNANT TUMOR OF THE SPHENOIDAL CAVITIES IMPLICATING VISION.

By JULIAN J. CHISOLM, M.D., OF BALTIMORE.

WITHIN eighteen months two cases of malignant disease supposed to have originated in the sphenoidal cells have come under my observation, making four cases of this serious lesion which I have seen in the past ten years. In both of these last cases the disease seemed to have started on the right side of the bone, at the base of the skull. The eye complication was recognized as of post-ocular origin, and the lesion was located about the Sella Turcica, on account of the ophthalmoscopic appearances of the discs and the disturbed action of the eye muscles. In both cases the left eye became secondarily involved, both as to the functions of the optic nerve and the action of the muscles moving the eyeball. In each case the nose implication was subsequent to the eye trouble. The first action of the growth in its malignant development was to invade by bone expansion the optic foramen at the apex of the orbital cone, and impress the structures passing through this opening, then slowly involving contiguous parts, until both sides of the skull about the median line became affected. In both cases progress was slow, requiring many months for development. In each, treatment was unavailing to stop the steady growth of the disease, until one succumbed to the general poison, and in the other life seems to be rapidly ebbing away amidst severe torture, which morphia in large doses and frequently repeated

can scarcely mitigate. One case was in a boy 7 years of age, the other in a member of the medical profession aged 37 years.

While the two cases have this in common, viz., a malignant growth at the base of the skull, destroying sight, then developing in the direction of the face, filling the eye sockets, pushing out the eyeballs, invading the nares, and exhibiting a striking similarity in the disfigurement produced, there are symptoms peculiar to each. The youth suffered no pain whatever when the disease was making rapidly fatal progress; the older patient, on the contrary, has suffered severely from the very beginning of his trouble, and the intense agony of his every-day life has shown no mitigation. The younger case commenced with nausea and vomiting, with headache, before any other symptom could be detected. When attention was called to the eye for the rapid deterioration of sight, the cerebral symptoms of nausea and headache suddenly passed away. They did not return, although for 16 months the disease in its anterior development, filling up the face cavities with its cancerous growths, steadily progressed to a fatal issue. In the elder the nausea with vomiting appeared among the last symptoms, when sight had already been nearly destroyed, and when prominent growths were developing in the temple and in the roof of the mouth. In both cases the mind remained clear throughout. In both the disease extended from the right to the left side. In neither case was there any general paralysis nor any evidence of extensive encroachment by the growth in the direction of the cranial cavity. The loss of smell was secondary to that of sight in the youth, while it was retained in the older case even when the disease had invaded the left orbit and had reduced vision in this eye to recognition of large objects, sight in the right having been utterly destroyed by pressure upon the optic nerve. The youth suffered from an external squint with ptosis, the older with internal squint followed afterward by ptosis. In both the drooping of the lids of each eye became prominent.

CASE 1.—P. S., aged 7 years, a very intelligent boy, was brought to the Baltimore Eye and Ear Institute by his father for treatment

April 24, 1879. His vision had very recently become defective. For some months he had suffered with headache, nausea, and, at times vomiting. The right side of the head was always the painful side, the left never annoying him. His sight had been defective for only two weeks. Vision in the right eye was most disturbed. It was the enlarged pupil of the right eye which had recently attracted the attention of the father, and had induced him to bring his son to Baltimore for treatment. The boy was well grown for 7 years of age, and from the promptness and intelligence of his answers seemed educated beyond his years. His general health was good. The natural expression of his face was somewhat disturbed by a slight drooping of the right lid and an external squint. Sight in the right eye did not exceed the recognition of large objects. No. xx of Jager's test type was the best that the left eye could do at one foot distance. An ophthalmoscopic examination exhibited a pallor of the discs, more marked in the right than in the left eye; also a clouding of the outlines of the optic papilla, which was so woolly in the right eye as to indicate a choked condition from postocular pressure. His physician had called the trouble one of optic nerve paralysis, and commenced a treatment with strychnia. No history of constitutional or inherited disease could be obtained. The early symptoms of nausea, vomiting, with headache, which had preceded for many months the defective vision, pointed to cerebral irritation, and intracranial trouble near the Sella Turcica was suspected. As the olfactory sense was perfect and the second and third nerve alone affected, the disease was diagnosed meningeal, and located about the chiasma, especially on the right side. The nature of the lesion could not be clearly defined, but a growth of some kind was suspected, and a treatment of iod. potash in full doses recommended, which the patient was to carry out in his distant home.

After an interval of two months the father of the boy reported by letter no improvement in the sight, but that the nausea and headache had disappeared very soon after the iod. potash treatment had been commenced.

April 24, 1880, one year to the day from the time of the first visit, the boy was again brought to the city for examination. He had been for some months totally blind. Sight had slowly left him, until all perception of light had vanished. He was altogether free from pain. He had a good appetite, and had not been nauseated for many months. His brain was clear, with bright intelli-

gence. The original source of trouble had during the year been made evident by the developing disease. His face was now deformed by the protrusion of both eyes—the left slightly, the right excessively. The right lids were very much distended, permitting the eyeball to protrude considerably beyond the bridge of the nose. Ptosis in both upper lids was marked. Both eyes were fixed in external squint, but not to any excessive degree. In extrusion the eyeball, of normal appearance, with dilated pupil, clear cornea, and white sclerotic, was pushed so far forward and toward the temporal side, that the optic-nerve entrance seemed to be in front of the orbital margin. The ophthalmoscopic examination gave white discs, with good-sized retinal vessels and media perfectly clear. The disc outlines were now sharply defined. The tip of the finger, introduced between the eyeball and orbital rim, detected an elastic mass, which filled the right socket. A similar mass could be felt on the nasal side of the left socket. The patient complained of inability of breathing through his nostrils. He had lost the sense of smell, and, to a large extent, that of taste. Inspection of the nostrils showed the meati plugged up by a red growth, which came near to the external orifice and protruded slightly from the posterior nares. The diagnosis was now made of malignant growth starting in the sphenoidal cells of the right side, first causing cerebral irritation with headache and nausea, then encroaching on the right optic foramen, making pressure interference with the optic nerve, first on the right side, and later on the left. Then developing by continuous growth in the direction of the face rather than toward the cerebral cavity, the cancer had filled the sockets and the nasal spaces, surrounding the eye muscles so as to stop their action, and causing the exophthalmus as well as the ptosis. The general functions of his brain and his digestive organs seemed to be in good working order. He ate well, slept well, and suffered no pain whatever. His father was advised of the hopeless condition of his son, and no treatment suggested.

June 14, 1880.—Six weeks from the date of the second visit I received a letter from his family physician announcing the death of the boy. From the letter I make the following extracts: "Death apparently came from exhaustion and septic poisoning. The eyeballs protruded excessively in hideous deformity. Bleeding fungous masses protruded from each nostril, and also could be seen behind the palate. These emitted a most offensive odor.

His hearing was only implicated a few days before his death. The most wonderful part to me was the total absence of all pain. I was not able to make a *post-mortem* examination."

The *second case* was that of Dr. H., of Michigan, aged 37 years. He consulted me April 29, 1881, to see if I could restore sight to the right eye and relieve him of severe pains on the right side of the head. He had suffered severely for several months. The pain was not constant, but during the paroxysms it was scarcely bearable. Besides the atrocious pains of the right eye and right temple he had also a painful throbbing in the right ear, with defective hearing. Quite recently the sight of the right eye had failed, and he had acquired a very ugly internal squint in this right eye. Upon examination of the eye movements it was found that while there was paralysis of the external rectus there was so marked a degree of irritation or spasm of the internal rectus of the right eye that he could not relax it, so that the pupil was fixed at the inner canthus in a 4-degree squint. He complained of a want of proper feeling over the right side of the face, implicating the fifth nerve. The right eye was very amblyopic, and the ophthalmoscope revealed a pale disc for this right eye. The vision in the left eye was normal. He could find no cause for his suffering and denied having any syphilitic infection. With the impression that the trouble was meningeal iod. pot. was prescribed in large doses. He had for some time used liberally hypodermics of morphia to assuage his pain and give him sleep.

Oct. 1st.—Five months after the first examination, Dr. H. came again to consult me concerning his case. I found him very much changed in appearance and with a countenance indicative of severe and long-continued suffering. Except when under the effects of morphia his pains have been excruciating. Recently he has been troubled much with nausea and vomiting and has also bled from the nose. In the right eye he has now lost all perception of sight, and vision has become so defective in the left eye that he can only see the outline of large objects. An ophthalmoscopic examination shows pale discs, but to no marked degree, while the vessels of the retina are but little shrunk. Ptosis has existed for some time in the right lid, and more recently the left lid has also drooped. In the right eye the former marked squint has disappeared, very little of it remaining. The eyeball is quite prominent, and seems fixed in its exophthalmic position by paralysis of all of its muscles, so that it possesses no movements what-

ever. The pupil of this right eye is widely dilated. The left eyeball is also much impeded in its motions. The tip of the finger inserted between the eyeball and the rim of the orbit detects in all directions an elastic mass or growth which has filled up the right socket. A similar growth can be felt in the left socket, especially toward the nasal side. None could be felt on the temporal side of the left orbit. He has lost all of the teeth in the upper jaw, and in the mouth cavity has recently appeared a very decided swelling under the mucous membrane of the palatine roof, right side, both of superior maxillary bone and palate bone. He still retains the sense of smell. A decided fulness is seen in the right temple under the temporal facsia which disfigures by giving great breadth to the right side of the head. Common sensation is nearly abolished on the right side of the face. While the facial nerve of the right side of the face retains its full action, hearing in the right ear is altogether lost, due to mechanical interference with the right Eustachian tube. The yellowish hue of the skin of the face exhibits the facies of malignant cachexia in a marked degree. His mind is clear, control over his limbs perfect, and has exhibited no paresis beyond those mentioned in the eye muscles from the invasion of the posterior portions of the orbit by the malignant growth. He recognized the hopelessness of his case, and was quite prepared for the diagnosis of malignant tumor rapidly advancing toward a fatal issue. The history of the case would point to the spheroidal cells as the origin of the growth, first involving the structures at the right optic foramen, and in its development implicating the left side of the Sella Turcica.

A CASE OF SEVERE INJURY OF THE ORBIT.

BY DR. E. L. HOLMES,

ATTENDING SURGEON; AND

DR. ROSWELL PARK,

ASSISTANT SURGEON TO THE ILLINOIS CHARITABLE EYE AND EAR INFIRMARY.

O. J., a boy 14 years of age, was brought from Wisconsin to the dispensary of the infirmary, June 13, 1881, with the following history of an accident which happened eight months before.

A piece of pine wood, thrown with great force from a rapidly revolving circular saw, penetrated the left orbit, through the middle of the lower lid. The local surgeon succeeded in removing only a few splinters.

An examination revealed a small fistulous opening, surrounded with polypoid granulations, in the integument of the lower lid; also a similar growth at the lower border of the cornea, with considerable redness and œdema of the lower part of the ocular conjunctiva. The contracted pupil and cloudiness of the cornea prevented a precise diagnosis of intra-ocular changes. There were slightly diminished tension of the globe, great loss of vision, with some tenderness and swelling of the side of the face, and impediment in the motion of the jaw.

It was difficult to determine, by probing, the direction in which the piece entered the orbit or from which the discharge came.

After the administration of ether, an incision was made along the border of the orbit through the integument at the fistulous opening. The finger could then detect a piece of wood firmly surrounded at its lower end by hard tissue. This piece extended upward between the conjunctiva and sclerotic to the lower border of the cornea. A careful examination seemed to demonstrate that the other portion of the stick extended into the antrum. And

yet there was no history of discharge of blood or pus from the nostril. The free end, lying between the conjunctiva and sclerotic, was easily removed through the incision in the lid, but broke off close to the bone. It measured an inch in length, an eighth of an inch in width, and a sixteenth in thickness.

A careful examination with the tip of the finger disclosed a small piece of wood corresponding to the piece broken off, but held firmly by the products of inflammation. It seemed to extend directly downward. As an operation involving other tissues than those of the orbit appeared necessary, the case was placed under the charge of Dr. R. Park. No theory seems satisfactorily to explain how the piece behind the conjunctiva was at a right angle to the "stick" finally removed by Dr. Park.

SUBSEQUENT ACCOUNT BY DR. R. PARK.

It having been the unanimous opinion of all who first saw the case that a comparatively small sliver of wood probably extended into the antrum, I proceeded to try to effect its removal. Accordingly, the following day, having anæsthetized the boy again, I prolonged the incision made by Dr. Holmes toward the inner canthus, and then down the side of the nose. Reflecting the flap thus made I perforated and entered the antrum. Prolonged exploration with the finger and probe failed to reveal the splinter. I again explored the orbit and could grasp the piece with the forceps, but not tightly enough to remove it, nor could I convince myself as to its exact position, since the swelling from inflammation and the previous operation interfered materially with any search.

In the meantime over an hour had elapsed: the parts being very vascular, the boy being weakened by free hemorrhage and two consecutive operations, and, moreover, beginning to tolerate his anæsthetic badly, it was decided to postpone further operative measures. Accordingly, a drainage tube was inserted into the antrum; the incisions were closed with silk sutures, and covered with dressings of cold water and alcohol.

The incisions healed well, though there was copious discharge from the tube. The boy's mother being anxious to take him home to avoid expense she was allowed to leave with him one week after the operation, with directions as to his care, and especially as to keeping me informed as to his condition.

Twice during September I heard that there was still discharge from the drainage tube which had been allowed to remain.

Finally, after some further correspondence, he came to the city in November, or about five months after his first visit.

Status præsens.—The tube having been removed a month before, the lines of my incision are all healed, and with surprisingly little cicatrix. There are more or less swelling and induration of all the tissues of the temporo-facial region. The mouth can only be opened to extent of three fourths of an inch ; there is more tenderness over the left temporo-maxillary articulation than anywhere else. There is a sinus at the site of the original injury, through which a curved probe passes downward and backward more than an inch without touching diseased bone. There is a fistulous opening on the left side of the soft palate, close to the hard palate. There is discharge from both these openings. According to the mother there has at several different times during the summer been a discharge from the left ear. There is now no visible opening or perforation of the membrana tympani through which it could have come. H. D., left ear, $=\frac{1}{8}$; right ear, $=\frac{3}{8}$. Membrana tympani is slightly thickened ; light spot irregular. There is coloboma above from simple atrophy of iris structure. This condition gives the pupil an oval slit shape. Media cloudy ; details of fundus invisible. The patient counts fingers at 6 inches if held above the level of the eye. The globe is almost immovable in the orbit, held so by products of inflammation.

Nov. 17, 1881.—With the assistance of Drs. Curtis, Tilley, and others, the boy being under the influence of chloroform (with 1 per cent. of amyl nitrite), I proceeded as follows : I first plugged the left posterior naris, and then laid up a flap of the cheek by a curved incision from the outer angle of the orbit to the angle of the mouth. Coming thus upon the site of the operation five months previous I found the antrum pretty well filled up with granulation tissue. A probe could now be passed downward and backward and through the fistula in the soft palate. Finding nothing in the antrum I then removed, with chisel, saw, and forceps, the inner half of the malar bone and almost all the floor of the orbit ; taking care, as far as possible, to peel off the periosteum before attacking the bone. Probing and searching toward the nasal side of the orbit I found nothing suspicious, and had begun to despair of finding any thing to reward my efforts. I resolved, however, to work outward, and removing more of the malar bone and outer wall and floor of the orbit, I at last touched with the probe something which felt very much like wood. Clear-

ing away the bone a little more, I caught with strong forceps and with some force extracted the foreign body. This was a piece of pine $2\frac{1}{4}$ inches long, and $\frac{1}{8}$ inch square at its base. It had been lying with its anterior extremity engaged on a level below the infra-orbital ridge, and on the external surface of the orbit; its posterior extremity, judging from its length and now evident direction, was engaged just in front of the maxillary articulation. In its entrance and course it must, therefore, have penetrated the infero-exterior wall of the orbit; having been thus lodged with one end in the orbit, the other in the zygomatic fossa, and lying across the outer extremity of the speno-maxillary fissure.

On further examination finding no other fragments I curetted the fistulous tracks, and then united the edges of the flaps, after inserting a drainage tube. The progress of the wound was satisfactory in every particular.

On Dec. 22d., the patient returned to his home. His condition at that time was as follows: Line of incision entirely healed. No change in condition of parts within the globe. The eye is now freely movable, and its movements follow those of the other eye quite accurately, except upward. Its upward motion is interfered with by a condition of ectropion combined, with a band of granulation tissue, forming a species of symblepharon. The ectropion is caused by the cicatrix following the injury and the operations. At some time in the future a plastic operation may be made for its partial relief; it was thought best to postpone this for a few months. Region supplied by the infra-orbital nerve entirely anæsthetic. V=fingers at 5 ft. in good light. Hearing distance, left ear, $\frac{4}{5}$.

TUMOR OF LACHRYMAL GLAND.

By JOSEPH A. WHITE, M.D.,

SURGEON-IN-CHARGE OF THE RICHMOND (VA.) EYE, EAR, AND THROAT INFIRMARY.

AS tumors of the lachrymal gland are not very common, these few notes from my case-book in relation to the successful removal of such a growth may be of some interest.

Mrs. E. Pye, a German lady, 60 years of age, has had a gradually increasing swelling at the outer part of the left upper eyelid for more than a year. Of late its increase has been more rapid, the eye being pushed down and toward the nose, so that it is now (May 1, 1881) difficult to close the lids over it. At times the eye is quite painful and tender to the touch, is inflamed, and has a constant muco-purulent discharge. V = $\frac{20}{80}$ both eyes, with $+$ $\frac{1}{8}$. R., V = $\frac{20}{80}$, with $+$ $\frac{1}{10}$. L., V = $\frac{20}{80}$. Ophthalmoscope shows left optic nerve to be quite reddened, with hazy outline and large tortuous veins.

The case was evidently one of lachrymal gland tumor. On May 13th I removed the tumor through an incision made along outer third of edge of orbit, just below the brow. It was dissected out with probe-pointed bistoury and scissors. It was firmly attached above to the periosteum and below to the conjunctiva, and extended far back into the orbit, pressing upon the optic nerve. It was removed intact, was ovoid in shape, measuring one and a quarter inches in its long and three quarters of an inch in its transverse diameter.

Very little bleeding followed the operation. The wound was closed by stitches, leaving a small drainage tube at outer angle.

Though there were considerable ecchymosis and swelling of the

eyelids and cheek, the wound healed kindly, and required little after-treatment. Three weeks later it was entirely healed; the eye had returned to its position, its movements were free, the vision the same as before the operation, and the lid drooped slightly.

It is now six months since the tumor was removed, and the most careful examination can detect no signs of a recurrence; the eye and lids are perfectly normal, both in appearance and motion, and the vision has improved to $\frac{3}{8}$, with $+$ $\frac{1}{6}$. My friend, Dr. Swan M. Burnett, of Washington, who, during the meeting of the American Medical Association, had examined the case, requested me to send him the tumor for microscopical examination when I should remove it. I sent him the specimen, and am indebted to his kindness for the following description of the tumor.

Microscopic appearances, by Dr. Swan M. Burnett, Washington, D. C.

The tumor is far from uniform in its histological structure. The connective-tissue element is rather abundant in some parts, while in others it is very scant or entirely wanting. The cellular element, which is largely predominant, is likewise irregular in its distribution. It consists of rather large round cells, with very thin cell-walls and large, granular nuclei. There are other cells smaller, with small or no nuclei, which are distributed in somewhat large collections throughout the tumor mass. The characteristic form of myxomatous tissue is seen in abundance in all parts of the specimen. Cylinders and alveoli lined with cells in the characteristic arrangement of adenoma are met with, particularly near the centre of the sections passing through the tumor in a transverse direction. The *remains* of those structures are quite abundant, but in only one or two places have I been able to find them entirely intact and in any thing like a normal condition. The alveoli are often filled with a hyaline mass (Becker), less frequently with round cells or granular matter.

From these appearances I think we are justified in describing the tumor as a *myxo-adenosarcoma*. From an examination of this specimen alone it would not be possible to trace a general history of such tumors, but it tends to confirm

the opinion of Becker¹ that all the forms of tumor of the lachrymal gland hitherto described are but different stages of the same morbid growth. It seems likely that they all begin as adenomas and that the various forms of degeneration—myxomatous, sarcomatous, colloid, encephaloid, etc.—come on later. The appearances in this specimen differ from that of Becker's in this, that the degeneration was greatest toward the periphery, while in his the periphery appeared the more nearly normal.

¹Ueber das Adenom der Thränendrüse—Bericht über die Augenlinik der Wiener Universität, 1863-65.

PRELIMINARY PAPER ON THE DETERMINATION OF
A STANDARD OF COLOR-SENSE FOR REFLECTED
COLOR BY DAYLIGHT; WITH A GRAPHIC DE-
SCRIPTION OF THE INDIVIDUAL LIMITS AND
AVERAGE RESULTS OF SIXTEEN CASES.*

By CHARLES A. OLIVER, M.D., OF PHILADELPHIA.

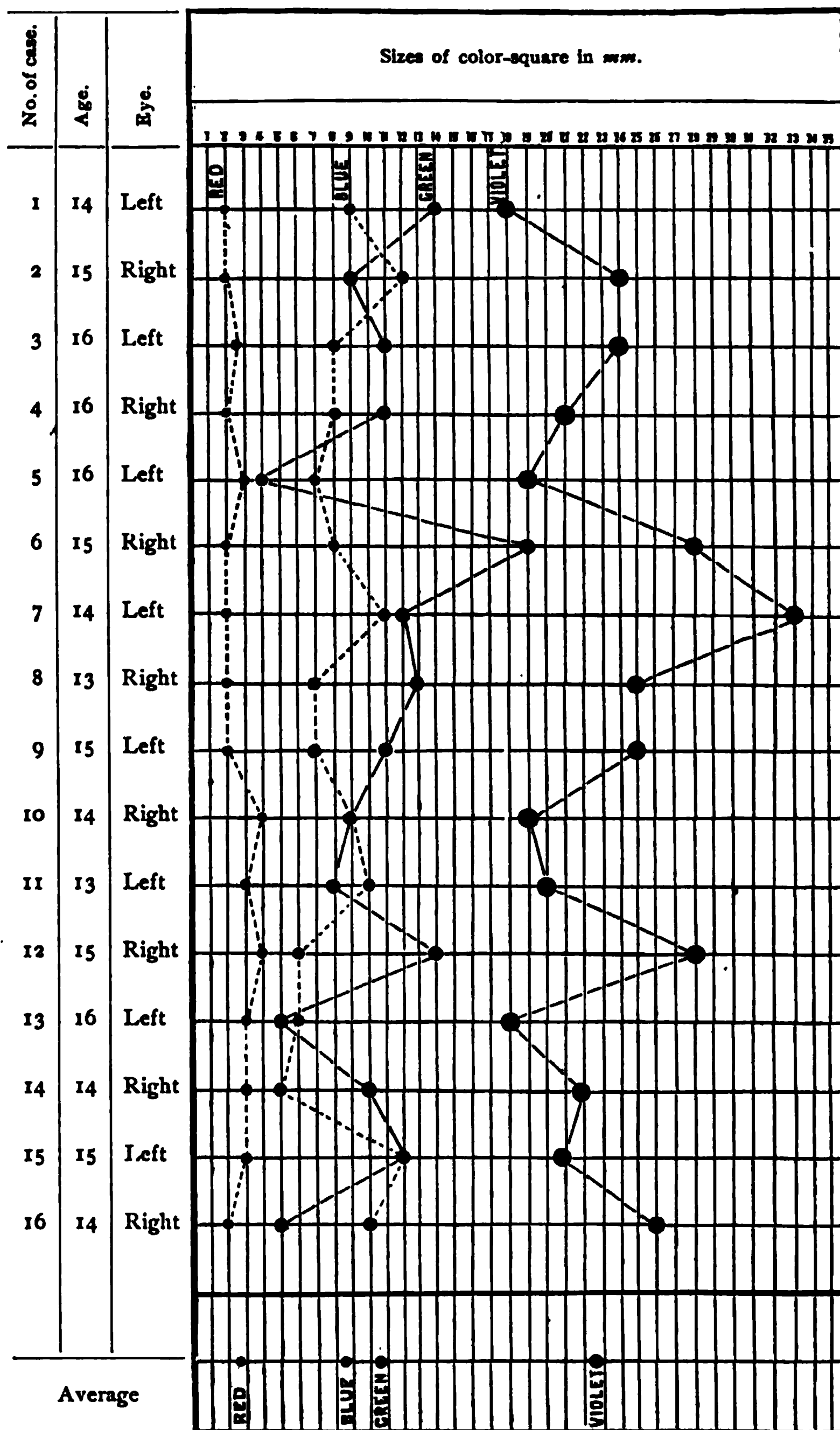
I HAVE been induced to endeavor to determine a standard for normal color-sense for reflected¹ color, because, as far as I am aware, no method independent of my own, has been devised by which minute and mathematical change in the size of the color has been made,—thus avoiding the necessity of either the gross division of the areas of color to be seen at a fixed distance, which must give rise to very imperfect computation; or the use of a certain fixed ratio of color to be perceived at variable distances, which, for many reasons, will give faulty results. In the method to be proposed, I have adopted an instrument capable of accurately exposing known areas of reflected color² to an eye placed at a designated distance.

The rules for the selection of cases, and of the order of examination being:

* It was thought advisable to publish this limited number of cases, for two reasons: 1, as an explanatory article, giving the methods of working and tables in full, so that others may continue the method, and thus rapidly augment the number of cases to a sufficient quantity to average a correct standard, as the author is convinced this is the only proper way to obtain accurate results; and 2, to avoid too bulky an article in his intended future publication, which, by this plan, can be reduced to a summary, in a tabular form, of the average results of the examination of one thousand eyes.

¹ The author is engaged in a series of similarly conducted experiments with *transmitted* light, which he intends for future publication.

² Description in the ARCHIVES OF OPHTHALMOLOGY, 1881, vol. x, No. 4, p. 438.



Condition of nerve.	Refraction.	Grade in school.
Superficially capillary, gray beneath	H. — 1 D.	Second year
Superficially capillary, gray beneath	Ah. — 0.50 D.	Third "
Reddish gray	E.	Third "
Decidedly gray	Ah. — 0.50 D.	Fourth "
Dirty red-gray	E.	Third "
Red-gray	Ah. — 0.50 D.	First "
Fair color	Ah. — 0.50 D.	First "
Grayish	E.	First "
Grayish	Ah. — 0.50 D.	First "
Good color	E.	First "
Slightly reddish gray	E.	First "
Fair color	Ah. — 1 D.	Third "
Superficially capillary, gray beneath	Ah. — 1 D.	First "
Very good color	H. — 0.50 D.	First "
Prominent 1.—1.500 D.	H. — 0.50 D.	Third "
Slightly off color	Ah. — 1 D.	Third "

during daylight for the four reflected colors, red, green, violet, and blue, at five for form and proper appreciation of color.

1. Young, healthy, intelligent male students possessing normal vision for form.¹
2. Possibility of color-blindness expunged by previous examination with Holmgren's skeins of worsted.²
3. All the subjects placed in the same condition in reference to position, light, and time of day.³
4. Color-perception taken first, then accommodation, and lastly ophthalmoscopic examination.
5. Each subject examined separately, and promise obtained not to divulge method of examination.
6. A color-sense measure used, so contrived as to give exact and mathematical increase of reflected color.
7. The eye *first* examined was the only one employed in the table, alternate eyes being chosen.

The reasons for such rules must be obvious. By them, I have endeavored by the process of exclusion to obtain as nearly a perfect human color-seeing organ as possible, and place it under the most favorable conditions in reference to its customary stimulus; avoiding any fatigue by not taking it all at once; using an instrument capable of fine differentiation, and excluding any possibility of previous knowledge of the colors, by making use only of the eye first examined.

During the course of the experiment it was observed:

1. Individual limits for the same color varied considerably, although all the conditions remained identical.
2. In all instances the observed color went through an almost regular series of changes before it was correctly perceived. These gradations were so regular that a table of the average changes has been constructed.
3. In many instances quantitative color-perception for the second eye of the same subject appeared to be comparatively stronger, bearing no relation to the eye itself, evidently entirely dependent upon previous knowledge.

¹ Tested several days previously.

² Tested several days previously.

³ Reflected sunlight. The subject with his back to the direction of light, was placed five metres from the measure, which was exposed to reflected sunlight of sufficient power to give nearly $\frac{1}{2}$ vision for form. As yet these investigations have been limited to daylight, because this being the ordinary stimulus in use, results obtained with it, must be of greater value than those obtained by the employment of other sources of illumination.

TABLE B.¹

SHOWING CHANGES IN COLOR AT FIVE METRES' DISTANCE.

RED.	GREEN.	VIOLET.	BLUE.
Reddish dot, $1\frac{1}{2}$ -2 mm. Red, 2-3	Bluish spot, 3 mm. Light blue, 4-6 Greenish blue, 6-8 Light green, 8-10 Pure green, 10-11	Dirty gray spot, 2 mm. Lighter gray, 4-8 Yellowish tint, } * Yellow, } 8-12 Pinkish, 8-12 Violet, 12-13	Dark bluish spot, 5-8 mm. Blue, 8-9

* Not universal.

4. Paradoxically, the objective condition of the nerve appeared to bear little if any relation to the perception of color.²

Conclusions :³

1. The standard of quantitative color-perception for reflected red by daylight at five metres is $21\frac{2}{3}$ millimetres.

2. Idem for green is $10\frac{2}{3}$ millimetres.

3. " " violet is $22\frac{2}{3}$ "

4. " " blue is $8\frac{1}{3}$ "

5. Each color passes through a regular series of changes before being correctly seen.

6. All other conditions being equal, no two individual eyes possess exactly the same amount of quantitative color-perception for reflected color. *Hence, a standard of color must be used.*

I here desire to express my thanks to Dr. J. F. Holt for his assistance in procuring the proper class of subjects.

¹ Compare with table in abstract of article by Cohn, ARCHIVES OF OPHTHALMOLOGY, vol. ix, No. 1, pp. 68 and 69.

² The author does not feel justified in placing this curious anomaly of results amongst the conclusions, as sufficient data have not been obtained.

³ These should not be accepted as final.

A CASE OF CONGENITAL DEFORMITY OF THE OPTIC DISC.

BY DR. THEODORE WIETHE,

Assistant to Jeager's Clinic in Vienna.

Translated by WILLIAM C. AYRES, M.D., New York.

(with Plate I.)

THE following case of unilateral congenital deformity of the papilla, with normal vision, will be found of interest on account of its rarity.

Caroline W., age 62, had been healthy all her life, with the exception of typhus fever at 30, and recently an attack of pneumonia. She menstruated at 13 regularly and without pain; during 12 years of married life bore three healthy children. At 52 climacterium occurred.

In the middle of January, 1881, she had croupous pneumonia on the right side, which was cured. Up to this time she saw equally well with both eyes, not having been aware of any ocular defect. During the above attack she had severe pain in the right eye, and pain in the right side of the head induced by frostbite; also pain in the nose, the alveolar process, and in the right half of the galea aponeurotica, extending to the back of the head. It returned regularly every two days, increasing in violence. The right eye was simultaneously obscured, and its sight rapidly declined. The left eye remained intact.

Status praesens.—Patient of middle size, delicate frame; hair blonde, eyes blue. Internal organs normal, symptoms of chronic glaucoma in right eye, marked development of "abdominal" vessels, slight ciliary injection, tissue of iris indistinct. Pupil dilated with bottle-green reflex; reaction slight. No cataract, but the images from the posterior capsule not distinct. + T₂; central vision $\frac{8}{80}$. Hm $\frac{1}{10}$. F normal. Color perception for larger surfaces normal. Perception of light $1\frac{1}{2}$ (by 25 □ mm.). The

fundus can not be seen distinctly, nevertheless it could be ascertained that there was no excavation.

Left eye H $\frac{1}{2}$, V = $\frac{3}{8}$ (Snellen) ; reads Jaeger No. 2 with the proper glasses. F normal. Color perception normal. No scotoma. Perception of light normal (L = 1, with 1.4 \square mm.). Pupil black, acts promptly, media transparent. T normal.

Ophthalmoscopic examination showed papilla round, with a small flattening on the temporal side ; but within its area were two black or olive-green depressions, with elliptical contours (see plate 1). They were both in the substance of the optic nerve, near the scleral ring. One was situated at the nasal end of the horizontal diameter of the papilla, and had its long axis vertical ; the other at the lower end of the vertical diameter of the papilla, with its longer axis horizontal. The first depression measured in its long axis $\frac{1}{4}$, and in its short axis $\frac{1}{8}$ the diameter of the papilla. The dimensions of the second were, long axis $\frac{1}{4}$, short axis $\frac{1}{8}$ diameters of the papilla. The bottom of the first was seen with $-4\frac{1}{2}$ D or $-\frac{1}{8}$, corresponding to a depth of 0.84 mm. The bottom of the second was obscured by a delicate grayish veil, so that an accurate determination of its depth was not possible ; nevertheless from the parallactic displacement of its edges in the inverted image, the condition of its surroundings and the course of the vessels, it was plainly shown that it was a depression, and not a simple pigmentation or elevation.

Before we go to a closer examination of the depressions we shall first describe the condition of the blood-vessels.

The central artery entered somewhat above the middle of the papilla, and divided itself on the surface of the nerve into the art. papillaris inf. and sup. (Magnus). The art. pap. sup. divided on the papilla into the art. temp. sup. and nasal sup., which last sent a horizontal branch toward the inner depression, passing over it near its upper edge.

A branch of the art. papill. inf. passed over the lower depression, but was slightly bent into it, the bend being covered with a fine grayish veil, but continued its way downward and inward on the level of the papilla. The art. pap. inf. itself made a sharp bend downward and sank into the depression, passed over the vena pap. toward the scleral ring, after crossing which it ran out into the retina.

The course of the veins up was much more complicated. The entrance of the vena pap. sup. was to the side of the artery, but at the same level. It had no relation with the two depressions. Just at its entrance a small vein passed downward toward the lower depression, but midway between the entrance and the depression it gave off a branch twice as large as itself, which ran directly toward the macula lutea. On venous pulsation this communicating vein raised itself above the level of the papilla. In this its volume is increased out of all proportion, and showed itself to be the inferior papillary vein, the highest point of which was below the level of the papilla. At the upper edge of the

lower depression (where the inferior pap. artery passed over it) it suddenly disappeared.

A little further on in the same direction a large vein came out of the bottom of the depression. At first it was covered by a grayish veil, which became thinner and thinner, until the vein was free; from its size and direction, accompanying the artery (which it often crossed like the thread of a cork-screw), it must be considered the inferior papillary vein. Shortly before it came out of the depression it sent off a small twig over the artery outward, which disappeared into the depth of the depression; this acted like a snare, and pulled the artery down.

There are two other veins to be mentioned in connection with the depression, which belong to the lower pap. vein. The one of these came suddenly out of the depth of the depression at its inner and lower border, and ran about one diameter of the papilla into the retina. It was accompanied by a delicate artery. The other vein came out of the papilla, near the upper outer edge of the depression, and sent off two branches toward the macula and one toward the depression, which passed into it, and was lost in its deeper parts.

The sides of the depression itself were steepest above, less so at the two ends of the longer axis, whereas near the scleral ring the descent was gradual. The deepest part corresponded to the entrance of the vena pap. inf. By measurement in the direct image it was shown that where the veil was thickest it was 0.47 mm. below the level of the papilla, but the bottom of the depression was still somewhat deeper. The temporal side was deeper than the rest, while along the scleral ring there was a gradual change from the level of the papilla.

In the same way that the inferior papillary vein, etc., came out of the lower depression, another equally as large as either of the papillary veins emerged from the upper one. It ran inward toward the nose. By focusing for the depth of this depression we could see another smaller vein, which sent off three branches respectively upward, inward, and outward. Only the upper one of these was to be seen throughout its entire length; it came from the depth of the depression, and passed over the arterial branch, which crossed the deformity as seen before. Those which ran inward and outward were lost sight of at the edge of the depression, passing under the tissue at these points. The form of this depression was a somewhat more eccentric ellipse. Its depth as before noted was 0.84 mm. Its sides were steep, especially toward the nose. When the light fell on the bottom it looked light-gray.

Besides these there was a slight partial physiological excavation extending outward from the entrance of the central vein.

The scleral ring was of equal width all around the nerve, and the remainder of the fundus was normal.

The explanation of this rare condition is very difficult. We

could hardly look upon it as a pathological defect, since a partial atrophy of the optic nerve gives an entirely different ophthalmoscopic picture, nor could such an atrophy produce depressions of such depth. A destruction of optic-nerve fibres by local hemorrhages must also be excluded, on account of the functional examination of the eye.

It is interesting to note that all this had occurred in the good eye, while in the glaucomatous eye there were no such peculiarities.

I think we are justified in considering it a congenital deformity, even if it is on one side only, since other congenital defects, such as pigmentation of the papilla, physiological excavations and elevations, and even colobomata of the sheath of the optic nerve, sometimes occur unilaterally. It is much more difficult to give an explanation of the production of such a condition.

An abnormal transparency of the optic-nerve fibres would not have such sharp contours. A separation of the nerve fibres showing a pigmented lamina cribrosa below would be elliptical, with its longer axis placed radially, while these stand exactly perpendicular to this position.

Might it be possible that we had to deal with the remnant of the foetal ocular cleft, limited to the optic nerve entrance? We know that the closure of this cleft takes place from in front backward, so that the part closed last is at the papilla, though in our case the scleral ring was not included in the defect, as is always observed in colobomata. We know further, that as long as the cleft remains open, the blood-vessels are situated in the groove of the optic nerve, and for a long time remain as foreign bodies in the nerve, and it is from them that the first effort toward a closure is frustrated. In this case we see large blood-vessels coming directly from the depression. Even under such an explanation in our case the excavation on the nasal side would still be unaccountable for, since its position forbids us to consider it as having any thing to do with the foetal fissure.

In spite of all this, I think, we cannot dismiss the supposition that the condition under consideration was the result of an arrest of development.

FOUR AMERICAN TEXT-BOOKS ON OPHTHALMOLOGY.*

Reviewed by SWAN M. BURNETT, of Washington, D. C.

Seeing four new American text-books on ophthalmology on our table brings forcibly to our mind the old adage, "It never rains, but it pours." From the birth of modern ophthalmology to the present time, the American student has had to rely entirely upon foreign authorities for the ground-work of his knowledge of diseases of the eye, if we except the small handbook of Dr. H. W. Williams, published some years ago. A text-book which should thoroughly and correctly represent the status of ophthalmology in America is a want that has, no doubt, "long been felt," and the idea of supplying the want, after the lapse of so many years, seems to have seized simultaneously four surgeons practising in the three great American cities of New York, Philadelphia, and Boston.

The first thought that would most probably strike a foreigner about to examine these works, would be whether they in any way represented so many "schools," in the sense that we speak of the Vienna and Berlin schools of ophthalmology. Even a casual examination would show him that there is nothing of the kind, and for the matter of that, nothing which could be called distinctively "American." They have all drawn sustenance from the mother of modern ophthalmic science—Germany—and, the small leaven of

* 1.—A Treatise on Diseases of the Eye, by Henry D. Noyes, A.M., M.D., etc., pp. xi x., 360. New York: Wm. Wood & Co., 1881. (No. 12 of Wood's Library of Standard Medical Authors.) Price, \$12.00 a set of 12 volumes of said library.

2.—The Diagnosis and Treatment of the Diseases of the Eye, by Henry W. Williams, A.M., M.D., etc., pp. xii x., 464. Boston: Houghton, Mifflin, & Co., 1881. Price, \$4.00.

3.—A Manual of Ophthalmic Practice, by Henry S. Schell, M.D., etc., pp. 263. Phila.: D. G. Branton, 1881. Price, \$2.00.

4.—A Manual of Diseases of the Eye and Ear, for the Use of Students and Practitioners, by W. F. Mittendorf, M.D., etc., 2d edition, pp. viii x., 432. New York: G. P. Putnam's Sons, 1882. Price, \$4.00.

native labor has not yet had time to leaven any considerable portion of the whole lump. Of this, however, we have no need to despair. The time must surely come when our contributions to ophthalmic science will be second to none. This is not vain-glorious boasting, but is only the legitimate following out of the law of the intellectual growth of nations. The four books before us are one of the signs of this growth.

Neither of the works before us is a model text-book—far from it. To write a model text-book requires a genius for that particular kind of work,—a mind which instinctively seizes upon the important and essential points, and leaves out that which is unnecessary and only confusing; a mind in other words, which crystallizes the existing knowledge of the subject. Each of the books under review has its peculiar points of excellence. Dr. Noyes' book is the most original, Dr. Williams' the most carefully written, while Dr. Mittendorf shows most industry in working up the literature of his subjects, and his book possesses the still further advantage of containing a treatise on diseases of the ear. The chief merit of Dr. Schell's work is its compactness and its low price. Aside from this, there are certain chapters in each on which the author has evidently bestowed a labor of love. Thus, we are sure Dr. Noyes has interested himself specially in affections of the muscular apparatus of the eye, while Dr. Williams is strong on inflammations—particularly of the anterior portion of the ball. Dr. Noyes has also given, very properly, much space to the consideration of anomalies of refraction and accommodation. This chapter is also very well worked out in Dr. Williams' volume.

If the publishers should, at any time, see the wisdom of issuing a new edition for the special student of ophthalmology, we are sure Dr. Noyes will correct a few errors which have not escaped our notice. It is rather a loose statement that "two per cent. or less" of women are color blind (p. 17). No examiner we have any knowledge of has ever placed the percentage as high as one. Probably one quarter of one per cent. would be more nearly correct. The cornea is *not* "the section of the large end of an ellipsoid" (p. 45). It is, on the contrary, if the measurements of Senff, Knapp, Donders, Mauthner, and others are to be relied upon, a section of the *smaller* end of an ellipsoid, that is, the end corresponding to the major axis. To give no other cause for irregular astigmatism than to say that it is "caused by opacity of the cornea or lens" (p. 69), is to mislead the reader

entirely. We are sure Dr. Noyes does not need to be told that the most common cause for irregular astigmatism is a want of homogeneousness and a difference in the refractive power of the different sectors of the lens. It also arises from irregular refraction of the cornea, caused usually by a difference of curvature in different parts of the same meridian. Corneal and lenticular opacities, unless they cause abnormal curvature, cannot in the strict sense of the word be said to produce irregular astigmatism. The image formed by the clear portion of the refracting body may be quite free from any kind of irregularity, but its clearness of outline will be marred by the diffusion of light caused by the semi-opaque spot. In speaking, too, of the production of regular astigmatism by the lens he refers to its want of homogeneousness, which is, to say the least of it, a questionable cause, and does not mention its oblique position, which was the cause first assigned for this anomaly by Young himself. There are some oversights in proof-reading, which will also be corrected, as, for instance, on p. 48, where 5 D is used and 0.5 D is meant. But of all the four books Dr. Noyes' is the one which the special practitioner will be likely to consult most, since he has given more marked attention to those points in which the practising oculist is most interested. On the contrary, the student would probably find any one of the others better for his purposes, on account of their better systematic arrangement and their conciseness,—if students will still insist on having things put to them in a nutshell. The crudeness of style of Dr. Mittendorf's book is quite a drawback to it, but we observe some improvement, in this respect, in the second edition, and we confidently expect, from its energetic author, still further improvement in future editions.

Of the mechanical "get up" of the volumes, that of Dr. Noyes' is the worst; because it is one of a cheap series. Fig. 10, on p. 13, is so badly printed as to lose all its significance. Dr. Williams' volume being from the Riverside Press is, naturally, as fine a specimen of book-making as we have in this country. Dr. Mittendorf's book is also well printed on good paper.

All of the books, with the exception of Dr. Schell's, have chromolithographic representations of the fundus of the eye in health and in some forms of disease. We wish we could say that they were good, but we cannot. The eight Dr. Williams has appended to his volume are better printed than the others, and those in the second edition of Mittendorf are some improvement on those in

the first, but all are crude and compare most unfavorably with such work as done by our Continental brethren. We are certain that well executed wood-cuts would be much more creditable to us, and quite as efficient for the purposes intended.

But, after all, we seriously doubt whether it is text-books on ophthalmology which we stand most in need of. No science is advanced by its text-books. These are, as a rule, the repositories of knowledge already acquired, rather than the promulgators of new ideas and opinions, and we must have these or we stand still or retrograde. A practitioner soon outgrows his text-books, and finds the necessity of wider knowledge and deeper study into the etiology, diagnosis, and treatment of the diseases he meets with. This he can get only from monographs on special diseases, or groups of diseases, prepared by men who have given much time to research into those special subjects. We have an example of this kind of work in the "Vorträge," of Prof. Mauthner, of Vienna, which have been appearing at intervals since 1878. It is with pleasure that we note in this place a translation into English of the first of these lectures on sympathetic diseases of the eye.¹

The first portion of this brochure was reviewed by the editor in No. 1, vol. vii. of these ARCHIVES. It may be said in regard to the second part, treating of pathology and therapeutics, that the author is of the opinion that sympathetic disease is conveyed both by the optic nerve and through the medium of the ciliary nerves. In therapeutics he makes a fight against what he considers indiscriminate enucleation, particularly as practised by the English school. As he has given his opinion categorically, we can best let him speak for himself.

"My creed in the question of enucleation runs briefly thus: It may be performed as a preventive; it *must* be performed in the stage of irritation; it *cannot* be performed in iritis serosa and iritis plastica; it *can* be performed in irido-cyclitis plastica, provided the eye causing sympathy is totally blind, but not in a state of violent irritation" (p. 170).

It may not be out of place to call attention, in this connection, to the American edition of Dr. Alt's work on the anatomy and pathology of the eye.²

¹ (The Sympathetic Diseases of the Eye, by Ludwig Mauthner, M.D., etc. Translated from the German by Warren Webster, M.D., etc., and James A. Spalding, M.D., etc., pp. 220. New York: Wm. Wood & Co., 1881. Price, \$2.00.)

² (Lectures on the Human Eye in its Normal and Pathological Conditions, by Adolph Alt, M.D., etc. pp. 208. New York: G. P. Putnam's Sons, 1880. Price, \$3.00.)

The peculiar excellence of the volume consists in the fact that it represents the actual observations of the author.

All the drawings (95 in number) were made by him from specimens in his possession. To one not possessing the large atlases of Pagenstecher and Genth or Becker, this volume will come as a very good substitute, and indeed it contains enough that is new and original to make it a very good supplement to these beautiful but expensive works.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE THIRD QUARTER OF THE YEAR 1881.*

By H. MAGNUS, Breslau ; C. HORSTMANN, Berlin ; AND
A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

E. NETTLESHIP, London ; C. E. FITZGERALD, Dublin ; E. MARCKWORT
and P. VON MITTELSTÄDT, Antwerp ; DANTONE, Rome ; VAN DER LAAN,
Lisbon ; HIRSCHMANN, Charkow ; S. M. BURNETT, Washington ; SCHIÖTZ
and OLE BULL, Christiania.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE ;
GENERAL PATHOLOGY, DIAGNOSIS, AND THERA-
PEUTICS ; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL,
AND HISTORICAL SUBJECTS.

395. ABADIE. Leçons sur la nutrition de l'œil. *Gaz. des Hôp.*, May 3,
1881.

396. ABADIE. Leçons de clinique ophtalmologique. Paris, 1881 : Doin ;
pp. 280.

397. ADAMŪK. Praktisches Handbuch zum Studium der Augenkrank-
heiten. (Practical manual for the study of the diseases of the eye.) Part i, 3
numbers. Kazan, 1881. A clear, rather comprehensive (for students) treatise
on refraction, accommodation, ophthalmoscopy, with entire avoidance of mathe-
matical formulæ.

398. ALEXANDER. Casuistische Mittheilungen aus der Augenheilanstalt zu

* Containing also papers of the first half of the year 1881 which were not
mentioned in the last report, published in vol. x, pp. 463-508.

Aachen. (Reports of cases from the ophthalmic institute at Aix-la-Chapelle.) *Deutsche Med. Wochenschr.*, Nos. 40 and 41.

399. BADAL. Clinique ophthalmologique de la faculté de médecine de Bordeaux. Paris, 1881; Delahaye.

400. Beiträge zur Ophthalmologie. Als Festgabe Friedrich Horner zur Feier des fünfundzwanzigjährigen Jubiläums seiner acad. Lehrthätigkeit gewidmet von Dufour, Haab, Knies, Michel, Schön, Wadsworth. (Contributions to ophthalmology. Dedicated to Friedrich Horner on the occasion of the twenty-fifth anniversary of his academic professional work, by Dufour, etc.). J. F. Bergmann, Wiesbaden, 1881.

401. BOURNEVILLE. L'année médicale, 1880. Résumé des progrès réalisés dans les sciences médicales. Paris, 1881; Delahaye. Ophthalmology is prepared by Poncet, and comprises 47 small quarto pages. The place of publication of the various contributions is not given.

402. BRAILEY, W. A. Curator's pathological report. (Roy. Lond. Oph. Hosp. Rep., vol. x, pt. 2, p. 225, June, 1881.) Cases of tumors, glaucoma, and hyalitis.

403. BURNHAM, J. H. House-surgeon's notes. Treatment of in-patients. (Roy. Lond. Oph. Hosp. Rep., vol. x, pt. 2, p. 216, June, 1881.) Use of carbolic acid lotion in gonorrhœal ophthalmia; corneal ulcer with hypopyon; entropium operated according to Burow (see the special chapters of this report).

404. CARRERAS-ARAGÓ. La ceguera en España. (Blindness in Spain.) Barcelona, 1881.

405. COLLARD. De oogen der studenten aan de rijksuniversiteit te Utrecht. (The eyes of the students at the state university of Utrecht.) *Nederlands Gasthuis voor ooglijders*, Bd. xxii.

406. CROVA. Comparaison photométrique des sources lumineuses de teintes différentes. *Comptes rendus. hebdomadaires de l'acad.*, No. 13.

407. CHARPENTIER. Examen de la vision au point de la médecine générale. Bibliothèque biologique internationale. Paris, Doïn, 1881, 15 wood engravings, pp. 13. The various methods of examination of the different functions of the eye are briefly but clearly explained, aided by illustrations. Unfortunately the useful little book lacks an index.

408. DOBROWOLSKY. Anomalien der Refraction und Accommodation des Auges von Prof. A. Nagel. Translated and remodelled from the German. St. Petersburg, 1881. Second improved and amplified edition, pp. 258.

409. DONDEERS. Rapport aangaande het onderzoek van het gezichtsvermogen van het personeel der Hollandsche Ijzeren Spoorweg-Maatschappij. (Report respecting the examination of the vision of the personnel of the Dutch railway companies.) *Nederlands Gasthuis voor ooglijders*, Bd. xxii.

410. DUYSE, VAN. Société ophthalmologique du royaume-uni. *Ann. d'Ocul.*, vol. lxxxvi.

411. DUYSE, VAN. Congrès périodique international des sciences médicales. 7e session, Londres. *Ann. d'Ocul.*, vol. lxxxvi.

412. EMMERT. Ueber die Häufigkeit infectiöser Augenkrankheiten zu

verschiedenen Jahreszeiten. (On the frequency of infectious diseases of the eyes at different seasons.) Internat. Med Congress, London. These ARCH., x. p. 334. By circulating blanks at about 30 cliniques it has been demonstrated that ophthalmia neonatorum is most frequent in May; diphtheritis conjunctivæ in January; hypopyon keratitis in August.

413. GÄRTNER. Versuche über den Raumsinn der Haut an Blinden. (Experiments on the tactile sense of the skin in the blind.) *Zeitschr. f. Biologie*, Bd. xvii.

414. GALEZOWSKI. Congrès médic. de Londres. Section d'ophth. *Rec. d'Opht.*, vol. iii, No. 9, Sept., 1881.

415. GABRIEL. Tableaux schématiques d'optique élémentaire. Congrès internat. d'ophth. *Compt. rend.*, Milan, 1881, p. 258. Movable figures intended for the demonstration of the elementary laws of optics in the lecture-room.

416. GIRAUD-TEULON. La vision et ses anomalies. Cours théorique et pratique sur la physiologie et les affections fonctionnelles de l'appareil de la vue. Paris, 1881; Baillière.

417. GREENHILL. On the meaning of the words "nyctalopia" and "hemeralopia," with a critical examination of the use of these words in the ancient Greek and Latin authors. Roy. Lond. Ophth. Hosp. Rep., vol. x, 2, June, 1881.

418. GROSSMANN. Ophthalmologisch-otiatrische Beobachtungen. *Wiener Med. Zeitung*, 1881, No. 20.

419. HERZING. Compendium der Augenheilkunde. Stuttgart, 1881, 3d edition. The methods of examination and the anatomical relations have received more attention than in the first edition.

420. HOPPE. Psychologisch-physiologische Optik in experimentell-psychophysischer Darstellung, Leipzig, 1881, p. 371. The author purposes to give an insight into the process of seeing, into the origin of visual perceptions in the brain. According to Hoppe, the physiological part of visual perceptions has been sufficiently elucidated by the ample number of thorough observations; not so the psychical part, i.e., the manner of the mental operation. Hoppe attempts to demonstrate what part in the production of visual perceptions is played by the eye with its optical apparatus, what part by the muscles of the eye, and what part by the action of the soul. He shows how the soul gains a perception from the material submitted to it by the organ of special sense, in order to preserve it as a conception. The book is a psychology of visual conceptions based on physiology.

421. JAVAL. L'évolution de la typographie considérée dans ses rapports avec l'hygiène de la vue. *Rev. scient. de France et de l'étr.*, 1881. June 25th.

422. H. KNAPP. Transactions of the Ophthalmic Congress at Heidelberg, Sept. 15 and 16, 1881. These ARCHIVES, x. p. 458.

423. H. KNAPP. Transactions of the Ophthalmic Section of the International Medical Congress held at London, Aug 3 to 9, 1881. These ARCHIVES, x. p. 332.

424. KÖNIGSTEIN. Untersuchungen an den Augen neugeborener Kinder.

(Examinations of the eyes of newborn children.) Lecture before the K. K. Gesellschaft der Aerzte zu Wien. *Wiener Med. Jahrb.*, 1881.

425. KRAUSE. Ophthalmological Society of Great Britain, March 31 and April 7, 1881. *Centralblatt f. prakt. Augenghlk.*, 1881, Sept.

426. Brief Report of the Ophthalmic Section (Section ix) of the International Med. Congress. *Klin. Monatsbl. f. Augenheilk.*, p. 354.

427. LANGE. Aus der St. Petersburger Augenheilanstalt. *Petersburger Med. Wochenschr.*, No. 40.

428. LEMOIN. Études sur l' action chimique de la lumière. *Compt. rend. hebdom. d. s. de l' acad.*, No. 13.

429. LEROY. Optique physiologique. Théorie de l' astigmatisme. Travaux du laboratoire de la clinique ophthalmologique de la faculté de méd. de Lyon. *Arch. d'Ophth.*, 1881, Nos. 3 and 4.

430. LORING. Danger in the eye-glass frame. Americ. Ophth. Soc. at Newport, July 27-28, 1881. The point which fastens the glasses together may penetrate into the eye ; two such cases have been observed.

431. LUCA, DE. Nota sulla canula lagrimo-nasale o canule di Dupuytren. *Accad. Med. Chirurg. di Napoli*, 1881, 26 Guigno. As early as 1780, that is thirty years before Dupuytren's time, an Italian physician at Naples employed canulas for the cure of lachrymal fistulæ.

432. MAUTHNER. Gehirn und Auge. (Brain and eye.) *Vorträge über Augenheilkunde*, vol. i, 6-8, Wiesbaden, 1881. With wood-cuts, pp. 254. Unsuitable for abstracting on account of its copious contents. Treated with an exhaustive knowledge of literature as well as of the subject, and with circumspect scientific criticism.

433. MITKEWITSCH. Zur Frage über die Verbreitung der Augenkrankheiten in Russland. (On the question of the occurrence of diseases of the eye in Russia.) *Der Arzt*, 1881, No. 39. In the military district of Odessa the number of eye patients amounts to 10 per cent. of the total soldiery ; among 10,394 recruits, 587 suffered from conjunctival affections, or 5.6 per cent. The highest percentage of eye diseases is found in the district of Bessarabia, 11 per cent., against Kowno, 10.8 per cent. ; Kamenetz-Podolsk, 9 per cent. ; Char-kow, 7.8 per cent. ; Suwalki, 6.3 per cent. ; Chaterinoslaw, 6.1 per cent.

434. MITTENDORF. Manual on Diseases of the Eye and Ear, for the Use of Students and Practitioners. New York, 1881, pp. 445. Price \$4.

435. NIEDEN. Die Ophthalmologische Section des VII Internationalen Congresses zu London. *Berl. klin. Wochenschr.*, No. 40.

436. Ophthalmic teaching in Ireland. *Med. Press*, vol. xxxii, 1881, Sept. 7th. The diploma of ophthalmic surgeon should be valid only if issued by a clinical ophthalmic institute having at least eight beds at its disposal, and holding not less than two polyclinics per week. With this, instruction in the use of the ophthalmoscope is indispensable.

437. PIERD'HOUY. Congrès périodique international d' ophthalmologie. Sixième session ; premier congrès de Milan, 1-4 Sept., 1880. *Compte rendu*, Milan, 1881. Inclusive of appendix, 430 pp., with numerous illustrations.

438. **PIERD'HOY.** Une visite aux aliénés de la province de Mombello. *Compte rendu*, Milan, 1881. Among 900 lunatics, there were 20 cases of corneal affections; nystagmus in 0.5 per cent.; alterations in the pupil, 60 per cent. Among 81 epileptics, inequality of the pupils in 42; sluggishness of pupillary motion, especially as regards dilatation on withdrawing the light, in 12. In two cases, a short time previous to an epileptic attack, decoloration of the papilla and narrowing of the retinal vessels, and in one, great repletion and pulsation of the veins. Nine cases were examined immediately after the epileptic paroxysm: in two of these the fundus was normal, the vessels but slightly contracted; in seven the arteries were normal, but the veins largely filled, and pulsating on even slight pressure upon the globe. 21 cases of dementia paralytica were examined: in 12 of these the pupil was elliptical in form and unequal in size on the two sides; unilateral myosis was present in most cases; in more advanced cases unilateral mydriasis was more frequent. The ophthalmoscope was used in 17 cases of dementia paralytica, and there was found: atrophy of the papilla, in two; negative result, in 5; optic neuritis, in 1; dimming of the papilla through a perineuro-retinitic oedema, in 9; at times spots showed themselves in the retina. 46 cretins and 30 idiots were also examined. Among the 46 cretins was found: nystagmus, in 4; convergent strabismus, in 2; pigmentation of the iris, in 2. Among the 30 idiots was found: unequal coloration of the iris (one blue, the other brown), in 2; strabismus, convergent in 1, divergent in 1; nystagmus, in 2; myopia with nystagmus, in 1. Altogether, therefore, 7 cases of nystagmus, of which two were rotatory, 2 lateral; in these cases, too, the skull was asymmetrical. In 75 per cent., more or less pronounced mydriasis. Of these cretins and idiots, 74 were examined ophthalmoscopically. The result was negative in 15; in 45 there were alterations resembling those in albinotic rabbits; the papilla was discolored, irregular in form; the arteries rather narrow, the veins broad and sharply defined; almost total absence of choroidal pigment; the vasa vorticosa clearly visible. In one, retinitis pigmentosa.

439. **PLANAT.** Règlement pour la construction et l'ameublement des écoles. Paris, 1881. Ducher.

440. **PONCET.** Congrès international de Londres. Section ix, Ophthal. *Progrès Méd.*, No. 36.

441. **PONCET.** Revue d'ophtalmologie. *Progrès Méd.*, No. 32.

442. - **RAVA.** Nuove comunicazioni ottalmologiche. *Ann. d' Ott.*, vol. 1, 4, 5.

443. **SCHRÖDER.** Das Buch vom menschlichen Auge. (The book on the human eye.) Stendal, 1881.

444. **SIMI.** Associazione ottalmologica italiana. IV. Riunione-Roma. *Bollet. d' Ocul.*, vol. iv, 2

445. **SPALDING.** Ophthalmology: Ancient and Modern. Annual Address before the Maine Medical Association, June 22, 1881. Portland, 1881. As the reviewer, a short time since, attempted to delineate the development of the profession of ophthalmology, so, in a similar manner, Spalding has described the historical development of our specialty, but has extended it to the present time, closing his delineation with v. Gräfe.

446. W. SYKES. Clinical note and remarks on a disease of the eyes peculiar to colliers. (*Brit. Med. Journ.*, vol. xlii, p. 77, July 16, 1881.)

The sight first fails in bad light, and grows gradually worse till the pupils are dilated and insensible to light, and only a perception of light remains, while nystagmus is well marked. Recovery takes place on exposure to light and air without other treatment. The miners attribute the disease to the bad light given by the safety lamp, but Sykes believes it to be toxic from gases accumulating in the pits.

447. TALKO. Die Ophthalmologie auf der Versammlung der Polnischen Aerzte und Naturforscher in Krakau vom 20. bis 25. Juli, 1881. (Ophthalmology at the meeting of Polish physicians and naturalists in Cracow.) *Kronika lekarska*, No. 20.

448. THOMAS. Revue bibliographique. *Arch. d'Ophth.*, 1881, Nos. 3 and 4.

449. TREITEL. Casuistische Mittheilungen. (Clinical contributions.) *A. f. A.*, vol. x.

450. WOLFE. Lectures on ophthalmology. *Med. Times*, No. 1,618.

b.—STATISTICAL PAPERS.

451. ADAMÜK. Ophthalmologische Beobachtungen aus der Augenabtheilung der Universitätsklinik zu Kasan, 1880. 5. Lieferung. Detailed reports of 2,309 eye patients; 1879 were treated at the clinic, 412 in private practice. Among 523 anomalies of refraction, 286 were hypermetropic (53½ per cent.); 212 myopic. Corneal affections amounted to 32 per cent, of the total number of patients; affections of the lens to 7½ per cent., namely 166 cases with 163 cataracts. Cataract extractions almost exclusively after von Gräfe's method, with 4.4 per cent. of failure. Affections of the retina and optic nerve 84, — 3.7 per cent.; among these atrophy of the optic nerve in 55, — 2½ per cent. Affections of the uveal track 61 cases, — 2.7 per cent. Glaucoma 66 cases, — 3 per cent. In unilateral glaucoma, iridectomy is performed at the same time on the healthy eye. Total number of operations 324, namely: iridectomies, 95; extractions, 90; discissions, 13; corneal transplantations, 4; trichiasis operations, 84.

452. ADELMANN. Geschichtliche und statistische Rückblicke auf die Augenklinik der Kaiserlich Russischen Universität zu Dorpat von ihrem Beginne bis zum Jahre 1877. (Historical and statistical retrospect of the ophthalmic clinic of the Imperial Russian University at Dorpat, from its commencement to the year 1877.) *Deutsches Archiv für Geschichte der Medicin und Medicinische Geographie*, vol. iv, Nos. 1-4. The German University at Dorpat was founded in 1802, and in the first fifty years it was attended by 5,973 students, of whom 2,180 were medical. The ophthalmological clinic was founded in 1868, and had an annual attendance of 1,500-1,700 patients. From 1805-1842, 4,740 eye patients were treated, and from 1842-1867, 9,150; from 1868-1878 the number of eye patients reached the total of 17,081. From 1842-1867, 9,150 eye patients were treated; of these were, affections of the lids, 873 (entropion 415, distichiasis 245, trichiasis 90); conjunctiva, 5,161 (trachoma, 1,847, chronic blennorrhœa, 524, chronic ophthalmia 406, sabacute catarrhal conjunctivitis

737, palpebral and bulbar conjunctivitis 378, chronic catarrh 366) ; cornea, 1,967 ; iris, 173 ; sclerotic, 70 ; choroid, 98 ; lens, 317 ; vitreous, 2 ; retina and optic nerve, 171 ; nerves, 27 ; muscles, 52 ; lachrymal apparatus, 67 ; globe and orbits, 119 ; anomalies of refraction and accommodation, 530. The peculiar form of the orbit in the Esthonians, as well as injurious external influences are said to predispose especially to diseases of the conjunctiva. Trachoma was treated with the solid stick of copper sulphate or of alum ; more inveterate cases with silver nitrate. Particularly effective was unguentum hydrarg. rubr. dialys., a quantity the size of a pea introduced into the conjunctival sac. In superficial leucoma electricity produced clearing.

453. BARDE. Hôpital ophthalmique à Genève, January, 1879, to December, 1880. Genève, 1881. During 1879, there were 1,155 dispensary and 282 hospital patients ; during 1880, 1,392 dispensary and 276 hospital patients. Graver operations, 320 ; of these 78 cataract extractions with 85.89 per cent. complete success, 7.69 per cent. partial success, 6.41 per cent. failures. The retention of cortical remnants is believed to be very dangerous by Barde, who therefore recommends extraction with the capsule. In hypopyon keratitis, antiseptic dressing ; pilocarpine in iritis and chronic choroiditis.

454. BEZOLD. IV. Bericht aus der Privatheilanstalt für Augen- und Ohrenkranke in München. *Aerztliches Intelligenzblatt*, No. 27.

455. BUSINELLI. Relazione annuale sul servizio sanitario nell' ospizio Margherita di Savoia per ciechi poveri in Roma. Roma, 1881.

456. CASTORANI. Rendiconto statistico delle malattie oculari, durante il biennio scolastico 1877-1879 nella r. clinica oftalmica. Morgagni. Luiglio, 1881.

457. CORSINI. Dispensario ottalmico. Cenni statistici per l' anno 1880.

458. DESPAGNET. Clinique ophthalmique du Dr. Galezowski. Relevé statistique des maladies soignées et des opérations pratiquées du 1 Juillet, 1880, au 1 Juillet, 1881. *Rec. d' Ophth.*, Sept., 1881, 8,651 patients were treated. Aniridia existed in 31 members of one family.

459. DREWES. Ein Beitrag zur Statistik und Diagnostik der syphilitischen Augenerkrankungen. Inaug. Dissert., Berlin, 1881.

460. HALTENHOFF. Deuxième rapport de la clinique pour les maladies des yeux. Genève, 1881. From July 1, 1878, till December 31, 1880, 1,447 eye patients were treated, and 140 operations performed ; of these, 17 were extractions, 11 successful (after Gräfe's method with small flap), 2 partially so, 1 failure. Two flap extractions ; 1 success, 1 failure. One simple flap extraction with partial success.

461. HIPPEL, VON. Bericht über die ophthalmologische Universitäts-Klinik zu Giessen aus den Jahren 1879-1881. Unter Mitwirkung der Assistenzärzte Dr. Vossuis und Dr. Markwald. Stuttgart, 1881. 853 patients were admitted to the clinic ; 2,821 were treated in the dispensary. 539 operations were performed, namely : on the lens, 72 ; extractions, 41 ; extractions with the capsule, 7 ; discissions, 7 ; operations on the iris, 142 ; iridectomies, 119 ; operations on the cornea, 57 ; on the lids, 96 ; on the retina, 2 ; on the muscles, 34 ; on the lachrymal apparatus, 104. Enucleations, 25 ; and exenterations of the orbit 5 ; after-treatment antiseptic. Employment of chloroform.

462. JOELSOHN. Einige Worte über die Augenkranken des 62 Kriegszeit-Hospitals. (A few words on the eye patients of the military field hospital of 1862.) *Militär-Medic. Journal*, 1881, May. During six months there were treated 249 eye patients; 41.3 per cent. simple conjunctivitis, 32 per cent. trachoma. Advocates the establishment of an ophthalmological station during a war.

463. KERSCHBAUMER, ROSA, und FRIEDRICH. Bericht über das Jahr 1879 und über 112 Staarextractionen nach v. Gräfe's Methode. Salzburg, 1881. New polyclinical patients, 1,828; new hospital patients, 238. In 69 extractions, very good vision; in 19, good; in 11, insufficient. One failure.

464. KERSCHBAUMER, ROSA, und FRIEDRICH. Bericht über das Jahr 1880 und über ein zweites Hundert Staarextractionen nach v. Gräfe's Methode. Salzburg, 1881. New polyclinical patients, 1848; new hospital patients, 349. 468 operations; 138 cataract operations; 84 senile extractions; 81 complete, 3 incomplete successes; 52 iridectomies; 24 operations on muscles. Of 100 extractions after v. Gräfe's method, in the course of sixteen months, 99 showed complete success.

465. MULES, P. H., Surgeon to the Manchester Royal Hosp. Extraction of cataract. (*Brit. Med. Journ.*, vol. xlii, p. 43, July 9, 1881). Dr. Mules reports on 77 cases of extractions with the following result: Wound enlarged with scissors, in 6 cases; vitreous lost in 4 cases; spoon used in 4 cases; 6 attacks of iritis after operation. One total loss from panophthalmitis; 66 recoveries with good vision for distance. The operation employed was the "modified linear of Gräfe." He divides his cases into complicated and uncomplicated. The former include cases of locomotor ataxy, diabetes, etc., and these all recovered satisfactorily. He performed needle operations subsequently on the capsule in 7 cases, and believes it would have been advantageous to do so systematically.

466. RÄHLMANN. Bericht über die Wirksamkeit der Universitäts-Augenklinik zu Dorpat für den Zeitraum von October 1879 bis April 1881 nebst kürzeren ophthalmologischen Abhandlungen. (Report on the working of the eye clinic at the University of Dorpat from October, 1879, to April, 1881, together with minor ophthalmological articles.) Dorpat and Fellin, 1881. Under treatment were 2,175 patients; cataract operations, 53; extractions after v. Gräfe's method, 36; iridectomies, 67; sclerotomies, 12 (but the temporarily reduced intra-ocular pressure generally soon rose again, while iridectomy lowered it permanently). In Esthonians with prominent supra-orbital margins the peripheral linear section was performed more inferiorly, without, however, forming a conjunctival flap.

467. REYMOND. Alcune annotazioni sulla medicazione di Lister nelle estrazioni della cataratta e quadri statistici delle operazioni d' estrazione praticate all' ospedale ottalmico dal 1 Gennaio 1880 al 1 Luglio 1881. Torino 1881. Disinfection with $1\frac{1}{2}$ per cent. phenol solution; operated under spray ($2\frac{1}{2}$ per cent.). After six days, the dressing is removed under spray and 4 per cent. borated lint substituted. Of 346 extractions performed in this antiseptic manner, the losses were but 2 per cent., while the losses with the employment of carbolic acid amounted to 9 per cent.

468. SCCELLINGO. Ambulatorio clinico oculistico. Rapports per l' anno

1880. Roma, 1881. 2,283 patients were treated, of which 70 per cent. suffered from affections of the conjunctiva and cornea. 19 extractions with small flap downward; 2 failures.

469. SCHIESS-GEMUSEUS. Siebenzehnter Jahresbericht der Augenheilstalt zu Basel vom 1. Januar 1880 bis 1. Januar 1881. Basel, 1881. Polyclinical patients, 1,340; hospital, 401. Operations, 198. Extractions, 51; of these, 46 with good, 2 with partial success, 3 failures. 9 discissions; 4 extractions with the capsule; 83 iridectomies; 7 sclerotomies; 14 enucleations; 15 operations on the muscles. A series of interesting clinical cases is added.

c.—OPHTHALMOLOGICAL JOURNALS.

German Journals.

470. *v. Gräfe's Archiv für Ophthalmologie*, Berlin, 1881. Bd. xvii, 2. 1. Steffan. Beitrag zur Pathologie des Farbensinnes. 2. Rothholz. Zur Aetiologie des Staphyloma posticum scleræ. 3. Haensell. Experimentelle Untersuchungen über das Verhalten der Hornhautgrundsubstanz bei traumatischer Keratitis. 4. Landesberg. Ueber das Auftreten von regelmässigem Astigmatismus bei gewissen Refractions- und Accommodationsanomalien. 5. Widder. Ueber Iritis syphilitica mit Rücksicht auf ihr Verhalten zur allgemeinenluetischen Diathese. 6. Michel. Ueber Iris und Iritis. 7. Schreiber. Zur Thränensackexstirpation. 8. Deutschmann. Zur physiologischen Chemie der Augenflüssigkeiten. 9. Michel. Antwort an Herrn Paul Baumgarten. 10. Wälchli. Microspectrische Untersuchungen der gefärbten Kugeln in der Retina von Vögeln.

471. *Archiv für Augenheilkunde*. Bd. x, 4 (July 15th). 1. Herdeggen. Ueber sogenannte Commotio retinæ. 2. Emmert. Des Mechanismus der Accommodation des menschlichen Auges. 3. Kubli. Die klinische Bedeutung der sog. Amyloidtumoren der Conjunctiva. 4. Treitel. Casuistische Mittheilungen. 5. Haase. Zur Embolie der Art. centr. ret. 6. Knapp. Subperiostale Enucleation einer Elfenbeinexostose des Sinus frontalis, welche in die Nasen- und Augenhöhle vordrang. Heilung per prim. intent. 7. Magnus und Nieden. Bericht über die Leistungen und Fortschritte der Augenheilkunde in der zweiten Hälfte des Jahres 1880.

472. *Ergänzungsheft zum Archiv für Augenheilkunde*. 8. August. 1. Mooren. Gesichtsstörungen und Uterinleiden. 2. Kubli. Die klinische Bedeutung der sogenannten Amyloidtumoren der Conjunctiva. 3. Nieden. Beiträge zur Lehre vom Zusammenhang von Hirn- und Augenaffectionen. 4. Krause. Beiträge zur Pathologie der sympathischen Augenentzündung. 5. Nieden. Ein neuer Fall von pulsirendem Exophthalmus.

473. *Klinische Monatsblätter für Augenheilkunde*. Zehender. Juli. 1. Samelsohn. Zur Flüssigkeitsströmung in der Linse. 2. Mandelstamm. Ein Fall von Bleiverbrennung der Augen mit günstigem Ausgang. 3. Mandelstamm. Ein Eisensplitter im Auge nach vierjährigem Verweilen eliminirt ohne sympathische Affection des anderen Auges. 4. Mandelstamm. Zwei Fälle von metastatischer Augenentzündung im Puerperium.—August. 1. Mooren. Zur Pathogenese der sympathischen Gesichtsstörungen. 2. Walb. Abscess der Conjunctiva bulbi.—September. 1. Schön. Der Venenpuls der Netzhaut.

2. Fröhlich. Celluloid-Prothesen. 3. Kurzer Bericht über die ophth. Section des internat. med. Congresses.

474. *Centralblatt für praktische Augenheilkunde*. Hirschberg. *Juli*. 1. Jany. Keratitis neuroparalytica. 2. Fuchs. Zur Behandlung der Conjunctivitis gonorrhoeica. 3. Samelsohn. Zur ophtho-therapeutischen Wirkung des Amylnitrits. 4. Heuse. Hemianopsie bei Schädelverletzung. 5. Pflüger. Zur Diagnose der Farbenblindheit.—*August*. 1. Steinheim. Zur Hemianopsia temporalis. 2. Schüller. Beiträge zur Pathologie des Sehnerven.—*September*. 1. Hirschberg. Ueber Colobom und Mikrophthalmus. 2. Hirschberg und Krause. Zur Pathologie der ansteckenden Augenkrankheiten. 3. Krause. Ophthalmological Society of Great Britain. 31. März und 7. April 1881.

French Journals.

475. *Revue clinique d'oculistique*. Armaignac. Meyer. Sichel. 1881, *July*. 1. Armaignac. Aniridie congénitale presque complète. Plusieurs attaques de choroïdite séreuse avec tension glaucomateuse du globe suivies de cécité temporaire presque complète. Luxation spontanée du cristallin dans le corps vitré; extraction de la lentille. Guérison. 2. Cataracte traumatique chez un homme de trente-quarante ans; résorption du cristallin; atrophie partielle du nerf optique; diminution considérable du champ visuel et de la vision. 3. Knapp. Enucléation sous-périostée d'une exostose éburnée du sinus frontal s'étendant dans la cavité orbitaire et nasale; guérison. Trad. Dr. Sédan.—*August*. 1. Armaignac. Cataracte congénitale double, adhérente à gauche; atrésie pupillaire des deux cotés résistant à l'action de l'atropine; microphthalmos; nystagmus continu; strabisme bilatéral en haut et en dedans; absence complète de fixation. Extraction du cristallin à gauche; iridectomie à droite; amélioration de la vue. 2. Armaignac. Cataracte congénitale double; hérédité morbide remarquable; opération à l'âge de 29 ans. Traumatisme de l'œil quatre mois après l'opération ayant occasionné la rupture complète de la plaie cornéenne et l'issue de l'iris et du corps vitré. Guérison rapide et conservation de la vue. 3. Armaignac. Extraction par un nouveau procédé d'un fragment de sonde d'argent logé par accident dans les voies lacrymales.—*September*. 1. Armaignac. Considérations sur l'étiologie et la thérapeutique des affections des voies lacrymales. 2. Piloni. Récupération tardive de la vision après une opération de cataracte.

476. *Archives d'Ophthalmologie*. Panas. Landolt, Poncet. 1881, *July-August*. 1. Panas. Sur l'élongation des branches du trijumeau dans le traitement du blépharospasme douloureux. 2. Landolt. Section optico-ciliaire. 3. Poncet. Section du trijumeau dans ses rapports avec l'œil. 4. Gayet. De l'expulsion totale de l'iris. 5. Abadie. Tumeurs rares symétriques des paupières. 7. Nuel. Un cas de colobome de la paupière supérieure et des sourcils. 8. Thomas. Revue bibliographique.—*September-October*. 1. Hocquard. Plaques épithéliales de la cornée. 2. Domalix. Du traitement des affections chroniques de la cornée par le massage de l'œil. 3. Delapersonne. Du chancre palpébral. 4. Macé et Nicati. Contribution à l'étude du champ visuel des couleurs. 5. Poncet. Congrès international de Londres. 6. Thomas. Revue bibliographique.

477. *Recueil d'Ophthalmologie*. Galezowski. Cuignet. *July*. 1. Cuignet. De la conjonctivite chronique simple. 2. Masse. Des tumeurs perlées de l'iris. 3. Gillet de Grandmont. Note sur un procédé, expérimental pour la détermination de la sensibilité de la rétine aux impressions lumineuses colorées. 4. Galezowski. Du traitement de la kératite interstitielle et de la sclérokératite par l'iridectomie. 5. Désallées. Du meilleur traitement du traumatisme de la cornée par l'épi de blé. 6. Chevalier. Bibliographie française. 7. Boggs. Bibliographie étrangère. 8. Parent. Bibliographie française.—*August*. 1. Baudry. Note sur un cas d'emphysème des paupières et de l'orbite. 2. Interiano. Du glaucome hémorrhagique. 3. Masse. Des tumeurs perlées de l'iris (Suite). 4. Haase. De l'embolie de l'artère centr. de la rétine. 5. Ott. Inflammation de la glande lacrymal (dacryadénite) terminée par suppuration. 6. Cuignet. De la conjonctivite chronique simple (Suite).—*September*. 1. Despagnet. Clinique ophthalmol. du Dr. Galezowski. Relevé statistique des maladies soignées et des opérations pratiquées du 1 juillet 1880 au 1 juillet 1881. 2. Leber et Deutschmann. Des affections du nerf optique et des paralysies musculaires consécutives aux blessures du crâne. 3. Herdeggen. De la prétendue commotion de la rétine. 4. Parent. Optométrie ophthalmoscopique à l'image renversée. 5. Cuignet. De la conjonctivite chronique simple (Suite). 6. Galezowski. Congrès médical de Londres.

478. *Annales d'Oculistique*. *July-August*. 1. Javal et Schiötz. Un ophthalmométrie pratique. Communication faite à Londres à la section ophthalm. du congr. méd. internat. 2. van Duyse. Société ophth. du Royaume uni. Compte rendu des séances.—*September-October*. Donders. Sur les systèmes chromatiques. 2. van Duyse. Le colobome de l'oeil et le kyste séreux congénital de l'orbite.

479. *Gazette d'Ophthalmologie*. Carré. *July*. 1. Carré. Notes de thérapeutique. Traitement des kératites (Suite).—*August*. Carré. Notes de thérapeutique. Traitement des kératites.

Italian Journals.

480. *Annali di Ottalmologia*. Quaglino. Bd. X, Fasc. 3. 1. Secondi. Esoftalmo pulsante. Storia e conferenza clinica. 2. Rampoldi. Sopra lo strato intergranulare della retina del cavallo. 3. Tartuferi e Albertotti. Sulle variazioni del valore di R. conseguenti alle evacuazione dell'umor aqueo.—Fasc. 4. 5. 1. Ravà. Nuove comunicazioni ottalmologiche. 2. Rampoldi. Della cheratite dei mietitori e dei suoi rapporti colla dacriocistite. 3. Tartuferi. Un caso di granuloma dell'iride senza cellule giganti. 4. Nicolini. Di una enervazione ottico-ciliare. 5. de Vincentiis. Sul glioma della retina.

481. *Bolletino d'Oculistica*. Simi. *July*. 1. Simi. Cauterizzazione ignea della cornea. 2. Simi. I bagni di mare nell'ottalmia scrofulosa.—*August*. Velardi. Un caso di alopecia ciliare alterna.—*September*. Piloui. Sopra un caso di cateratta.

Spanish Journals.

482. *La crónica oftalmológica*. Del Toro. *July*. 1. Del Toro. Contribucion a la historia del tratamiento de la sífilis ocular. 2. Del Toro. Intoxicacion de la atropina en los instilaciones a los ojos.—*August*. 1. Diaz.

Rocafull. Algunos casos mos de merpos extraños implantados en et interior del ojo. 2. Lopez-Ocaña. Albugos corneales de extraña y notable forma.—*September*. Guijo. De algunas afecciones oculares que complicar la enterocolitis aguda y la diarrea idiopática de la primera infancia.

483. *Revista especial de oftalmologia, sifilografia, dermatologia, y afecciones urinarias*. Rodriguez Viforcas. *July*. Garau y Alemany. De la hemeralopia y su frecuencia en el soldado.—*August*. Perez Caballero. La oftalmometria, procedimientos y aplicaciones.—*September*. Santiago Ramon y Cajal. Investigaciones experimentales sobre la genesis inflamatoria y especialmente sobre la emigracion de los leucocitos.

484. *Revista de Ciencias Médicas*. Carreras Aragón. *July*. Carreras Aragón. Herida de la córnea con cataracta traumática y presencia de una portion de cápsula de piston entre los celulas del cristalino. Extracion del merpo extraño y del cristelina. Curacion.—*August*. Carreras Aragón. El Daltonismo y los alterationes visuales en los empleados de los ferrocarriles.—*September*. Montardit. Optometro-astigmometro.

II—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

485. BRADFORD. The electro-magnet in ophthalmology, with the description of a new instrument. *Bost. Med. & Surg. Journal*, 1881, March 31.

486. CAJAL Y RAMON. Investigaciones experimentales sobre la genesis inflamatoria y especialmente sobre la emigracion de los leucocitos. *Revista especial de oftal.*

487. LEARTUS CONNER. The use of hot water in the local treatment of diseases of the eye. *Amer. Jour. Med. Sci.*, Oct. Led by the experience of gynecologists in the use of hot water in inflammations of the uterus, Dr. C. has tried the same agent in all forms of inflammation of the eye. All practitioners are acquainted with the beneficial effects of moist warmth in affections of the iris and cornea, but its application to inflammation of the lids and conjunctiva has not, we believe, been hitherto suggested. The theory of its action is that it contracts the walls of the blood-vessels without producing any preliminary irritating effect. He orders it to be used as follows: A basin containing not less than two quarts of water, as hot as can be borne by the hand, is placed on a chair so as to be easily reached when the body is bent forward. The water is then thrown up on the closed eyelids with open hand. No sponges or cloths should be used. This douching should be continued for five minutes, at intervals ranging from three to ten times a day according to the urgency of the symptoms. It is not proposed to dispense with other means of treatment where they are indicated. [The theory is at variance with the generally accepted opinions as to the influence of warmth on the blood-vessels.—K.]

SWAN M. BURNETT.

488. DERBY. Anæsthesia and non-anæsthesia in the extraction of senile cataract. *Amer. Ophth. Soc. at Newport*, July 27 and 28, 1881. Of 200 extractions, 100 were performed with, 100 without anæsthesia. Of the 100 performed with anæsthesia, there was: loss of vitreous, in 14 cases; duration of treatment, 18.3 days; S in 81 cases — $\frac{1}{10}$ and over; in 8 cases, S — $\frac{1}{10}$ — $\frac{1}{10}$; total failure in 9 cases. In 100 extractions performed without anæsthesia, there

was: loss of vitreous, in 9 cases; duration of treatment, 16.5 days; S in 89 cases at least $\frac{1}{10}$ or better; in 9 cases, S = $\frac{1}{10} - \frac{1}{10}$; total failure only one.

S. M. BURNETT.

489. FALCHI. Effets du pus injecté dans l'œil, spécialement sur la rétine et la choroidé. *Compte rendu. Congr. inter. d'ophth., Milan, 1881, p. 327. Comp. No. 41 of the last report.*

490. FIALKOWSKY. Ueber den Einfluss russischer Bäder auf das gesunde und kranke menschliche Auge. (On the influence of Russian baths on the healthy and the diseased human eye.) *Wratsch, 1881, No. 9.* The influence upon diseased eyes is greater than on healthy eyes. After the bath the pupils are somewhat dilated or react sluggishly; both the far point (?) and the near point are slightly removed from the eye; the range of accommodation, therefore, is somewhat diminished. Visual acuteness suffers no change. Moreover, after the bath, conjunctival and retinal hyperæmia occurs; the secretion of mucus and tears becomes increased. Any inflammations present are intensified.

491. GALEZOWSKI. Extraction au moyen d'un aimant d'une tige de fer fixée dans la rétine. *France Méd., No. 19.*

492. GRILLI. Sistema antissetico e termo-cauterio. Livorno, 1881.

493. GRÜNHAGEN. Mechanische Reizung des Ramus ophth. Mechanical irritation of the ramus ophth. leads to a secretion of all the fibrinogenous substances into the aqueous humor. Irritations of one eye influence, if not to the same degree, at least in like manner, the other eye. *Verein f. wissensch. Heilkunde zu Königsberg am 18 April, 1880. Berliner klin. Wochenschr., 1881, No. 35.*

494. GUNN, R. M. On the continuous electrical current as a therapeutic agent in atrophy of the optic nerve and in retinitis pigmentosa. (*Roy. Lond. Ophth. Hosp. Rep., vol. x, pt. 2, p. 161, June, 1881.*) 1. In optic atrophy Weiss' continuous current battery (the Foreaux-Smee; the elements are zinc and platinized silver) of 25 cells was the instrument used. The positive pole was placed on the closed eyelid and the negative applied to the supra-orbital region, the top of the spine, and to a point just behind the mastoid process, in order to determine which position gave the greatest light impression. Five or seven cells were only employed at first. The supra-orbital region was the point selected in the majority of cases. The position of the poles was changed during the sitting, which lasted from five to six minutes. Of the 18 cases thus treated, six improved, four were doubtful, and eight did not improve, or grew worse. Two of the six cases which improved returned some time afterward with their sight as bad as before, and did not improve under further treatment. No really conclusive results were obtained, because of the small number of the cases and the fact that this was not the sole method of treatment, as iodide of potassium or strychnia, or other nerve tonics, are noted as having been given in all the cases but one.

G. considers, nevertheless, that when we compare the above results with those obtained where no galvanism has been employed, there must be a strong presumption in favor of its utility in certain cases. He is sceptical of the efficaciousness of iodide of potassium, and looks upon strychnia and the other nerve

tonics as possibly of some use when combined with good food. He gives an analysis of the cases with reference to the question of prognosis, and the conclusion he arrives at is, that "he should give the most favorable prognosis when the patient is young or middle-aged, with recent failure of sight and present ability to count fingers at least. Color-perception is possibly defective. The disc is white, but the large vessels are of normal size. There is no history of severe injury to the brain or spinal cord, but perhaps there are symptoms of locomotor ataxy."

2. Retinitis pigmentosa. Of the value of galvanism in this disease G. speaks hopefully. He reports four cases, in each of which there was a decided improvement. In Case 1 the patient's condition on admission was: Right eye, V — fingers at 3'; Left, V — $\frac{2}{8}$ with — 36', and when discharged: Right, V — $\frac{2}{8}$ nearly; Left, V — $\frac{2}{8}$ nearly. G. refers to the literature of the subject, and draws attention to cases reported by Neftel and Dor, in which there was marked benefit by this treatment. He considers that the continuous current is capable of stimulating the *conductivity* of the optic nerve, both as regards the electrical current and the current originated in the impression produced upon its end-organs by means of light, and that this counteracts the degeneration of the nerve tissue which follows the absorption of light by the pathological pigment deposits. The defective blood supply also tends to produce further degeneration, and possibly galvanism has a temporary effect in dilating the blood-vessels, and so improving the nutrition of the tissue.

The caution to be observed in using the remedy is to begin with a weak current of five or seven cells for a short time, and then gradually increased if necessary.

FITZGERALD.

495. HARDY. On electro-magnets for ophthalmic use. *Transact. Ophth. Soc. Un. Kingd.*, 1881, vol. i, p. 220. Comparison of the instruments devised by Bradford and by Coxeter.

496. HEBB, R. G. and BRAILEY, W. A. On the phenomena of suppurative hyalitis and their relation to the "Migration Theory." (*Roy. Lon. Oph. Hosp. Rep.*, vol. x, pt. 2, p. 269. June, 1881.) H. and B. give a detailed account of the various changes found in cases of suppuration occurring either spontaneously in a defective eye or in direct consequence of some local injury, and the general conclusion they arrive at is, "that the migration of the colorless blood-corpuscles bears no part in these cases of suppuration of the vitreous body. They are thus clearly marked off in their pathology from metastatic suppurations of the eyeball when the vitreous cavity has become full of pus from a migration of colorless corpuscles from the blood-vessels."

FITZGERALD.

497. HIGGENS. Hyposclèral cyclotomy. *Transact. Oph. Soc.*, vol. i, 1881. 7 operations; results fair.

498. HIRSCHBERG. Ueber Entfernung von Eisensplittern aus dem Augennern. (On the removal of fragments of iron from the interior of the eye.) *Arch. f. klin. Chir.*, Bd. xxvi.

499. HORNER. Die antiseptische Methode in der Augenheilkunde. Internat. Med. Congress zu London. *Berliner klin. Wochenschr.*, No. 40. These ARCHIVES, vol. x, p. 333. No spray. 5 per cent. carbolic acid solution for

cleansing, 5 per cent. salicylated cotton for dressing. In suppuration, instillation of 2 per cent. carbolic acid solution into the conjunctival sac, and opening of the extraction-wound, with removal of the products of inflammation from the anterior chamber. By means of such employment of antiseptics, the loss in cataract operations has been reduced from 4.8 per cent. to 1.5 per cent. In favor of antiseptics Reymond and Leber have taken sides; while, on the other hand, Knapp and Hirschberg have obtained equally good results without it. The question of antiseptics in ophthalmology, therefore, remains still open.

500. JONATHAN HUTCHINSON. **The laws of inheritance in relation to disease.** Lecture IV delivered at the Royal College of Surgeons of England. (*Med. Press and Circular*, vol. xxxii, p. 22. July 13, 1881.)

In his fourth lecture on Laws of Inheritance, Jonathan Hutchinson treats of heredity of retinitis pigmentosa. It rarely appears at birth, though he believes the tendency to it to be present, but it shortly develops and increases with age. Consanguineous marriages tend to strengthen the predisposition to the disease, and Liebreich has found it to be very common among Jews. Retinitis pigmentosa is allied to certain forms of choroiditis and to disease of the optic nerve. In retinitis pigmentosa the choroidal structure is interrupted and the retina is gradually obscured by a dense pigmentary deposit. The vessels shrink, and when once the series of events is established it pursues a certain and inevitable course to the end. He then refers to the tendency of defects of the optical structure of the eye to be transmitted and become hereditary, and quotes cases in point, *e. g.*, myopic families. He further says: functional changes once duly fixed by pathological changes are transmitted from individual to individual, and that which at the outset ranked only as an idiosyncrasy may by and by develop into a determinate disease. An instance of this is afforded by a form of amaurosis due to excessive tobacco-smoking, the tobacco here acting not as the actual producing cause of the disease, but as an excitant of the tendency to defect when once originated. FITZGERALD.

501. KRENCHEL. Anwendung des Magneten zur Entfernung von Eisensplittern aus dem Innern des Auges. (Application of the magnet for the removal of fragments of iron from the interior of the eye.) *Dansk Hospitaltidende*, Sept. 28, 1881. Report of three successful extractions.

502. LEBER. Ueber die Wirkung der in das Innere der Augen eingedrungenen Fremdkörper. (On the action of foreign bodies which have penetrated into the interior of the eye.) Internat. Med. Congress zu London. These ARCH., x, p. 333. The mere presence of a clean, chemically indifferent body within the eye causes no inflammation. Clean bodies of common metal (iron, copper) which undergo oxidation within the eye cause no suppurative inflammation, but atrophy of the vitreous, detachment of the retina. If suppurative inflammation occurs in consequence of the penetration of foreign bodies into the eye, it is due to the entrance of germs of low organisms. Certain chemical substances, such as arsenic, mercury, croton oil, incite suppurative inflammation, even if they entered the eye in a pure condition. Suppurative inflammation in the eye, therefore, may arise from chemical irritation, without the participation of microbia. The injection into the eye of boiled extracts of fungous fluids incites inflammation which soon again disappears. It is probable that this inflammatory effect of microbia rests upon their generation of certain

chemical substances which act as inflammatory irritants. Intra-ocular cysticerci produce purulent inflammation, the origin of which is to be ascribed to the generation of an irritating secretion.

503. OWEN, D. LOYD. Extraction of cataract by small angular flap. *Birmingham Med. Review*, July, 1881, p. 254.

504. LOPEZ-OCANA. El parasitismo en oftalmologia. *Jurado médico-farmacéutico*, Nos. 31, 33.

505. MANFREDI. La profilassi anti-settica nella chirurgia oculare. Collezione italiana de letture sulla medicina. Letura, vol. v. Maggio, 1881. Milano.

506. MICHEL. Ueber den Zusammenhang von oculären Störungen mit Störungen im Circulationsgebiet der Carotis. (On the connection of ocular disturbances with disturbances in the circulatory region of the carotid.) *Sitzungsbericht der physik. med. Gesellschaft zu Würzburg*, No. 6.

507. MICHEL, JUL. Das Verhalten des Auges bei Störungen im Circulationsgebiet der Carotis. (*Affections of the eye from disturbed circulation in the carotid.*) Beiträge zur Ophthalmologie. Festgabe zur Feir des 25-jährigen Jubiläums von Horner. Wiesbaden, 1881. If a carotid artery be compressed in man, a paling of the papilla of the corresponding side, a fainter column of blood in the arterial vessels, and a diminution in width of the venous retinal vessels may be observed for a short time. This stage passes quickly, and great venous stasis and absence of venous pulsation show themselves. A similar venous stasis of the retina is visible when one arm is stretched upward. Ligation of one carotid is followed, immediately after the operation, by complete arterial and venous anæmia; later, by filling of the collateral channels; but a venous hyperæmia persists on account of the diminution of arterial pressure. This alteration is observed in the eye corresponding to the ligated carotid. In the venous system of the side opposite to the ligated vessel, a stronger rhythmical pulsation can be seen. Atheroma of the carotid is in intimate relation with opacities of the lens; the so-called senile cataract, as well as unilateral cataract with unknown cause, finds in this a satisfactory explanation.

508. MORANO, FRANCESCO. In quali forme di catterata convenga l' estrazione della capsula in sieme alla lente. *Giornale delle Malattie degli Occhi*, vol. iv, 1881. Morano rejects extraction of cataract within the capsule in general, but would have it employed in capsular deposits, in cataracta accreta, and in shrunken cataracts. DANTONE.

509. NORRIS. Administration of anæsthetics in Bright's disease, and on some cases of sudden death after cataract operations. *Amer. Ophth. Soc. at Newport*, 1881, July 27th-28th.

510. NOYES. Cure of cataract by electricity. *Amer. Ophth. Soc. at Newport*, 1881, July 27th-28th. A seeming cure of a cataract by electricity proved to be a case of choroiditis in which, under electrical treatment, flakes in the vitreous had disappeared.

511. PONCET. De la section du trijumeau dans ses rapports avec l'œil. *Arch. d' Ophth.*, vol. i. After criticising the experiments of others, Poncet formulates the results of his own as follows: The symptoms of the sec-

tion of the fifth pair are totally different from those after optico-ciliary neurotomy, in which the division of the blood-vessels plays the chief part. The keratitis travels from the surface to the depth and is of a traumatic nature. Iris and ciliary processes are not implicated at first. In the retina, disturbances of circulation (reflex from the severed trigeminus on sympathetic fibres of the carotid plexus) produced oedema of the inner layers, with hypertrophy of the ganglionic cells and the inner granular layer. Myosis by preponderance of the action of the sphincter. A year after the section, the nerves of the cornea are reproduced.

512. SAMELSOHN. Zur Extractions-Methode mittelst des Magneten. *C. f. A.*

513. SCHENKL. Ueber Antisepsis in der Augenheilkunde. *Prager med. Wochenschr.*, No. 11.

514. SIMI. I bagni di mare nell' ottalmia scrofulosa. *Bollet. d' Oc.*, 1881, August.

515. SOROKIN. Zur Kenntniss des Leptothrix oculorum. *Der Arzt*, No. 5.

516. SOROKIN. Zweite Notiz über Parasiten des Auges. *Der Arzt*, No. 16. The forms observed by Förster and Gräfe do not belong to leptothrix. In the cornea of an eye which had perished from panophthalmitis, he observed long, thin, opaque filaments; they are thicker than those of leptothrix buccalis, show a tendency to twist themselves lengthwise around each other, or to assume a curved form. Attempts at cultivation failed, excepting in human blood; here the filaments lengthened, gathered themselves together in a curved form, showed transverse marks of segmentation, and divided into two to five pieces of different length; the process lasted from twenty-five minutes to one hour. The new pieces congregated and thus formed additional bundles. This is a new form, leptothrix oculorum Sorokini. In an eye affected with panophthalmitis after iridectomy, and also in an existing catarrh of the lachrymal passages, he found filaments dividing dichotomically, having a thickness of 2 or 3 division marks of the micrometer; they also exhibited transverse division, and thus formed widened rings. The twigs branch off only where there are transverse divisions. Besides these, there were folds of cells of various size and shape. All attempts at cultivation failed.

517. RAMPOLDI. Dell' iridectomia considerata come atto premunitorio alla estrazione della catterata. *Annal. d' Ottalm.*, vol. x, 2. On the basis of 18 extractions according to Gräfe, which Quaglino had performed on decrepit persons in whom a preliminary iridectomy had been made two weeks or several months previously, the author thinks that a certain preservative action ought to be ascribed to the preliminary iridectomy. DANTONE.

518. SPENCER WATSON. Modification in cataract operation. *Med. Times and Gaz.*, May 7, 1881, p. 525.

519. TARTUFERI e ALBERTOTTI. Sulle variazione del valore di R. conseguenti alle evacuazione dell' umor aqueo. *Ann. d' Ott.*, vol. x, 3.

520. THEOBALD. Report of section on ophthalmology and otology. Transact. of the Med. and Surg. Faculty of Maryland, 1881. T. divides the diseases of the eye, according to their therapeutics, into four classes: those treated with astringents (alum, zinc, silver nitrate); those in which atropine is indicated;

those requiring general medication; and those in which glasses are employed.

521. VERDE, SALVATORE. *La chirurgia oculare conservativa*. Morgagni, fasc. 5. Maggio, 1881.

522. WADSWORTH. Neurotomy of the optic and ciliary nerves. Amer. Ophth. Soc. Fifteen clinical cases.

523. WILSON. A brief consideration of 20 cases of foreign bodies in the eye. *The Canada Lancet*, May 2, 1881.

524. WOLFE, J. R. On artificial pupil. (*Med. Times and Gaz.*, June 1, 1881, p. 611.) In a lecture delivered at Anderson College, W. gives the indications for the operation, and, among the contra-indications, says that in occlusion from specific iritis no operation should be attempted till twelve months after all disappearance of irritation in the eye. During the twelve months' interval the patient is to be kept on iodide of potassium and mercury. W. describes the operation and points of selection. He deprecates the employment of iridotomy.

FITZGERALD.

III.—INSTRUMENTS AND REMEDIES.

525. BRADFORD. Electro-magnet for the removal of foreign bodies from the eye. The instrument was demonstrated by Derby at the meeting of the Amer. Ophtham. Soc. These ARCHIVES, vol. x, p. 236.

526. BROWNING. A binocular ophthalmotrope. These ARCHIVES, vol. x, p. 249.

527. BULLER. Case of sudden and complete blindness after large doses of quinine. These ARCHIVES, vol. x, p. 327, and Trans. Amer. Oph. Soc. After seven doses of 20 grains, blindness, with large immovable pupils. Around the cherry-red macula was a gray opacity of the retina. After a blindness of 60 hours vision began to be restored. After five days blue and red were distinguished and fingers were counted. On the eighth day all the colors were recognized in a subdued light. The retinal vessels small, the discs pale. Only a long time afterward S — $\frac{3}{8}$. Treated with nitrite of amyl.

528. CARRERAS-ARAGÓ. Echelles métrico-décimales. *Intern. Ophth. Congr. of Milan*, Report, p. 245. For the measurement of acuteness of vision and the determination of astigmatism.

529. DEL TURO. Intoxicacion de la atropina en los instilaciones a los ojos. *La Crónica Oftal.*, 1881, July.

530. FRÖHLICH. Celluloid protectors. *Klin. Monatsbl. f. Augenh.*, p. 449.

531. GALEZOWSKI. Dell'omatropina e della sua azione sull'occhio. *Trad. d. Bountah. Ann. d'Ott.*, vol. x.

532. GATTI. Amaurose passagère consécutive à l'administration du salicylate de soude. *Courier Méd.*, 1881.

533. GREEN. Iridectomy with division of an anterior synechia by the use of Wecker's pince-ciseaux. *Amer. Ophth. Soc.*, 1881.

534. JAVAL ET SCHIÖTZ. A new optometer and a practical ophthalmometer, demonstrated at the *Intern. Med. Cong. of London*. These ARCH-

IVES, vol. x, p. 335. *Berl. klin. Wochenschr.*, No. 40. *Ann. d'Ocul.*, vol. lxxxvi. *Intern. Ophth. Congr. of Milan*, Report, p. 12. The optometer consists of three superimposed rotating discs of 30 cm. diameter, with a series of glasses at the periphery of the discs, the first one of positive spherical, the second of negative spherical, the third of cylindrical glasses. The latter can be rotated in such a manner that their axis will occupy any desired inclination. In the ophthalmometer the plano-parallel glass-plates of *Helmholtz's* apparatus are replaced by a *Wollaston* double refracting prism.

535. JOX, WEBSTER. A new refraction ophthalmoscope. *Lancet*, Sept. 24, 1881.

536. KLEIN. Artificial eyes. *Real-Encyclopädie*, vol. vii.

537. KRÖMER. The use of antiseptic solutions of atropine and eserine. *Corresp.-Blatt. f. Schweizer Ärzte*, vol xi.

538. LANDOLT. Blépharostat. *Intern. Ophth. Congr. of Milan*, Report, p. 210.

539. LIBBRECHT. Instrument pour opérer les cataractes secondaires. *Intern. Ophth. Congr. of Milan*, Report, p. 113. A forceps, with one fixed and one movable branch; the fixed branch has at the end the shape of a linear double-edged knife, with a longitudinal furrow, into which the other branch is fitted.

540. LITTLE. Homatropine hydrobromate; is it a powerful mydriatic? *Phila. Med. Times*, 1881, Feb. 26th. Homatropine is less active than atropine.

541. LORING. Kératomètre. *Intern. Ophth. Congr. of Milan*, Report, p. 157. Upon a metallic disc are placed a number of plano-convex discs, which on their back have a representation of the iris; the discs have different curvatures. The instrument is then placed alongside of the eye to be examined, and it is then seen upon which disc the reflex image of an object shows the same size as the cornea which is being examined.

542. MARTIN. Communication sur l'emploi de la lumière bleue combinée avec la lumière blanche dans la thérapeutique oculaire. *Intern. Ophth. Congr. of Milan*, Report, p. 16. Blue and white glasses are put in one frame, and united by Canada balsam. This combination is said to have a peculiar action upon the eye, to strengthen the eye, favor nutrition, and increase innervation (?). *Gariel* properly remarks in the discussion that such a combination cannot effect any thing else than to produce a light blue.

543. MAZZA. Sondes creuses pour le traitement des fistules capillaires et des dacryocystites. *Intern. Ophth. Congr. of Milan*, Report, p. 206.

544. MONTARDIT. Optometro-astigmometro. *Revista d. Ciencias Méd.*, 1881, July.

545. OLIVIER. The comparative action of homatropine and the sulphate of atropia upon the iris and ciliary muscle. *Amer. Journ. of the Med. Scienc.*, 1881, July. $\frac{1}{40}$ — $\frac{1}{20}$ grain of homatropine does not paralyze accommodation, an effect which is produced by atropine; $\frac{1}{10}$ grain dilates the pupil ad maximum, but the action is not as rapid as that of atropine, and the effect disappears sooner. Homatropine, when absolutely neutral, does not

irritate the conjunctiva. $\frac{1}{40}$ grain does not cause any constitutional symptoms.

546. PEREZ, CABALLERO. La oftalmometria, procedimientos y aplicaciones. *Revista especial de Oftalmologia*, 1881, August.

547. PETTORELLI. De la nitro-atropine et de la nitro-daturine ; leurs effets sur l'organe de la vue. *Intern. Ophth. Congr. of Milan*, Report, p. 203. 0.02 of the alkaloid is dissolved in 10.0 of water ; rapid and long-continued dilatation of the pupil.

548. RAEHLMANN. Hyperbolic lenses. *Klin. Monatsbl.*, p. 303. There are two systems of hyperbolic lenses : in the one, A, the axis of the hyperbola is $\frac{1}{4}$ mm.; in the second, B, 2 mm.. Either system has 11 numbers. The glasses of the system A are stronger. The principle of classification is the elevation of the cone of the asymptote, which, upon a basis of 30 mm., belongs to the corresponding hyperboloid.

549. REGNAULDET VALMONT. L'atropine. *Journ. de Pharm. et de Chimie*, 1881, July.

550. RISLEY. The sulphate of hyoscyamia as a mydriatic. *Phil. Med. Times*, 1881, Feb. 26. RISLEY used this mydriatic in eight cases, and found that in quickness of action it is more similar to that of atropine than of duboisine. S. M. BURNETT.

551. RISLEY. Comparative value of the mydriatics, including the sulphates of atropia, duboisia, and hyoscyamia, and the hydrobromate of homatropia, for the purpose of determining errors of refraction. *Amer. Ophth. Soc.*, 1881, July 27.

552. SALTINI. Sull' impiego del bisulfato de chinino nella cura dell emeralopia idiopatica. *Ann. d' Ott.*, vol. x, 1.

553. SAMELSOHN. The therapeutic action upon the eye of nitrite of amyl. *C. f. A.*

554. STEVENS. Self-registering perimeter. *Intern. Med. Congr. of London*. These ARCH., vol. x, p. 231.

555. SEELY. Prevention of the irritating effects of atropia. *Cincinnati Lancet and Clinic*, March 26, 1881. Astringents or the yellow oxide of mercury are used in order to prevent the irritating action of atropine.

556. SZIKLAI. Intoxication par la pilocarpine. *France Méd.*, No. 27, Sept. 23, 1881.

557. THEOBALD. Remarks upon the use of duboisia in ophthalmic practice, with report of a case in which alarming constitutional symptoms followed its application to the eyes. *Maryland Med. Journ.*, vol. viii. T. thinks the toxic action of the drug more likely to manifest itself in an uninflamed eye than in one that is inflamed. Its unpleasant effects are manifest within an hour after it is applied to the eye. SWAN M. BURNETT.

558. WORRELL. Duboisine caused in one case narrowing of the visual field with diminution of vision (glaucoma). *Amer. Ophth Soc.*, July 27, 1881.

IV.—ANATOMY.

559. ANGELUCCI. The structure of Descemet's membrane and the development of Schlemm's canal and Fontana's spaces in their relation to the etiology of glaucoma. *Intern. Med. Congr. of London*. These ARCH., x, p. 341. *C. f. A.*, p. 314. Descemet's membrane is a product of the corneal endothelium. Fontana's canal is produced in the foetus by the entrance of the aqueous humor between the elements of the iris, choroid; and the insertion of the ciliary muscle. Descemet's membrane does not participate in the formation of Fontana's canal.

560. AYRES. The development of the eye. *New York Med. Journ.*, July, 1881. This article treats especially of the development of the lens, which at first is hollow and round.

561. BERGER. The eye of *Luvarus imperialis* Raf. Comparative physiological studies on the coast of the Adriatic Sea. Vol. iv, Heidelberg, 1881.

562. BEYER. Persistent hyaloid artery, Cloquet's canal, and fissure at the optic-nerve entrance. *Prager Med. Wochenschr.*, Nos. 34 and 35.

563. CARRIÈRE. The eyes of *Planaria polychroa*, SCHMIDT, and *Polycelis nigra*. *Arch. f. Microsc. Anat.*, vol. xx, 2.

564. CHARNLEY and FOX. Three cases of new formation of blood-vessels in the vitreous. *Royal London Ophth. Hosp. Rep.*, vol. x, 2.

565. HAAB. **Anatomical examination of an anophthalmus at the age of 27.** Ophthalmological contributions on the occasion of the jubilee of HORNER. Wiesbaden, 1881. The ocular muscles normally developed; the globes appeared as small nodules, the size of a bird-shot; the optic nerves were delicate, thin threads, the orbits of normal size. Sclerotic, choroid, pigment epithelium, retinal elements, and vitreous could be demonstrated in the eye, but no conjunctiva, cornea, iris, ciliary body, and lens. The optic nerve consisted only of connective tissue. The optic tracts could be followed as white strings up to the corpus geniculatum internum. The corpus geniculatum externum was absent: the pulvinar thalami optici distinctly smaller. The thalamus and corpora quadrigemina could not be distinctly traced.

566. HIRSCHBERG. Coloboma and microphthalmus. *C. f. A.*, September. Congenital microphthalmus is in some cases combined with amaurosis, opacity of the lens, diminished tension, cyclitis, and coloboma of the iris. Hirschberg has observed four cases of this kind.

567. LEGAL. **The development of the naso-lachrymal duct in mammals.** *Inaug. Dissert.*, Breslau, 1881. In the embryo of the hog the lachrymal canal is solid at the beginning; it develops from the deeper layers of the epidermis at the lachrymal groove into the connective tissue, becomes detached from the epidermis, except at the posterior end, at the inner canthus, and with its anterior end it becomes connected with the nasal cavity. The detached solid epithelial cord forms the subsequent lachrymal duct and the upper canaliculus; the lower one proceeds from it, but not reaching the surface of the lid remains useless. The formation of the lumen begins at the ocular end and is brought about by the sequestration of the epithelial cells. Also in rabbits and mice the lachrymal canal is at the beginning a solid proliferation of cells,

which starts from the lachrymal groove, becomes detached, and finally transformed into a canal. The same process probably takes place in all the amniotic animals.

568. LEYDIG. The eye-like organs of fishes. Bonn, 1881. Certain spots upon the ventral surface of some sea-fishes, which by LEUCKART had been explained as secondary eyes, are not taken as organs of special sense by LEYDIG, who supposes that they are allied to the spendo-electrical or electrical organs of other fishes.

569. MICHEL. The layer of nerve fibres of the retina. *Verhandl. der phys.-med. Gesellsch. zu Würzburg*, ii series, vol. xv, Nos. 3 and 4.

570. MICHEL. Iris and iritis. *G. Arch. f. Ophth.*, vol. xxvii, 2. I. HISTOLOGY. The proper substance of the human iris is enclosed between two membranes: the anterior limiting membrane is a delicate layer of endothelial cells; the posterior one consists of peculiar cellular elements; upon its posterior surface is a pigment layer of nearly round, irregularly arranged pigmented cells. Behind the endothelial membrane is a layer of anastomosing cells interspersed with lymphoid cells, and resembling the reticulated structure of the lymphatic glands; for this reason MICHEL calls it the reticulated layer. Behind this layer, and partly projecting into it, is a radiating trabecular arrangement of connective-tissue fibres; these trabecles support the numerous blood-vessels and nerves; they are covered with flat cells, and the spaces between the trabecles, and between these and the posterior limiting membrane, are filled with a reticulum of cells, arranged in a similar manner as in the reticulated layer. For this layer Michel proposes the name "vascular layer." From in front backward the iris consists, therefore, of the following layers: 1, anterior limitans (endothelial membrane); 2, reticulated layer; 3, vascular layer; 4, posterior limitans; 5, pigment layer. From its histological elements the iris would appear to be a modified glandular structure. The system of lacunæ are lymphatic cavities in which the nutritive material, filtered from the blood-vessels, is collected; the anterior chamber is a large lymph-cavity. II. DEVELOPMENT. 1, In the human embryo the development of the sphincter portion takes place very early; that of the ciliary portion at the end of the sixth month. 2. The pupillary membrane is a pellicle which contains nuclei, epithelial cells, and blood-vessels; the latter two disappear, and the pupillary membrane becomes the endothelial layer upon the anterior surface of the iris. 3. At a certain period of foetal life there is a fold in the ciliary portion, the plica iridis. If the two opposite surfaces of the pupillary membrane are not separated, the so-called membrana pupillaris perseverans will be formed. 4. At a certain period of foetal life the posterior portion of the iris shows three layers: the pars ciliaris retinae; the pigment layer; the limiting membrane. The pars ciliaris retinae becomes pigmented and disappears. 5. The pigment layer and limiting membrane send projections into the sphincter portion; the largest and most strongly pigmented projection is at its peripheric portion, the so-called pigment spur. 6. During embryonic life smooth muscular fibres cannot be demonstrated in any part of the posterior limiting membrane. 7. During the last months of embryonic life, and in the new-born the posterior portions consists of only two layers: the pigment layer and the limiting membrane. 8. The limiting membrane must be taken as a continuation of the primitive limitans

retinæ. 9. The projections from the posterior limiting membrane into the sphincter are the connective-tissue septa, which separate the bundles of the muscle. The pigmentation of the so-called stroma of the iris is of post-foetal development.

571. NINIER. De la région maculaire au point de vue normal et pathologique. *Arch. Génér. de Méd.*, 1881, Sept.

572. OGNEFF. Histiogenesis of the retina. *Centralblatt f. d. Med. Wissensch.*, No. 35. 1. In the earliest stages (rabbit's embryo) the retina consists throughout of spindle-shaped cells with oval nuclei and a narrow zone of protoplasm. From both ends of the cells, which lie on a different level, both inward and outward, are processes which are vertical to the outer surface of the retina and which pass through its entire thickness. Here and there upon the outer surface of the retina are large transparent elements with round nuclei. Distinct membranes which would be taken as the outer or inner limiting membranes are not found at this stage. 2. The next changes are that the innermost cells become divided, larger, and rounder. Their nucleus becomes more distinct and they send off several processes which again form multiple ramifications. The processes, which run inward and of which each cell sends off one only, turn and take a course parallel to the inner surface of the retina. They are the first indication of the layer of nerve fibres. The outermost layer of cells is distinguished by thick, at their inner end foot-like projections; these elements are the embryonic Müller's radial fibres. The formation of the nerve cells and of Müller's fibres is therefore one of the first embryonic changes in the retina. 3. Then between the nerve fibres and the spindle cells above them there appears a small stripe, the first indication of the molecular layer. At this period the layer consists of numerous processes of the nerve cells, of the straight columns of Müller's fibres and of processes of the spindle cells and numerous very small granules. 4. The layers become more and more developed; especially the molecular and nerve-cell layers become more sharply defined and thicker. Free nuclei and roundish cells appear in the molecular layer. 5. The differentiation of the retinal layers becomes completed by the formation of the rods and of the two layers of granules. The rods are processes of the outermost layer of cells, which grow beyond the outer limiting membrane. The retina of the mammalia shows the same process of development as that of the birds and batrachia.

573. PREISS. Observations on Descemet's membrane. A contribution to the knowledge of the endothelia and their interstices. *Virchow's Arch.*, vol. lxxxiv.

574. RAMPOLDI. Sopra lo strato intergranulare della retina del cavallo. *Ann. d' Ott.*, vol. x, 3.

575. SAMELSOHN. A case of *Diprosopus triophthalmus* in a newborn kitten. *Berlin. klin. Wochenschr.*, No 13.

576. SCHNEIDER. The innervation of the ocular muscles in the ganoids. *Jenaer Zeitschr. f. Naturwissensch.*, vol. xv, 2 series, vol. viii, 2.

577. WADSWORTH. The fovea centralis in man. Contribution to ophth. The jubilee of HORNER. Wiesbaden, 1881. It details the different relations of thickness and extent of the fovea in a four-year-old girl.

578. WALCHLI. Microspectral examination of the colored globules in the retina of birds. *G. A. f. Ophth.*, vol. xvii, 2. There are three kinds of coloring matter in the globules: sphærorhodin, sphæroxanthin, and sphærochlorin.

579. WALL. Congenital absence of the eyeballs. *N. Y. Med. Rec.*, March 26, 1881. The appendages of the eyes and the lachrymal glands were present.

580. WETSCHTAMON. An anomalous structure of the human eye. *Äerztliche Zeitung*, Nov. 1881, No. 36. Absence of both irides. Both eyes turned in and up.

581. WIETHE. A case of congenital deformity of the papilla. These ARCHIVES, vol xi, No. 1. The papilla showed two dark elliptical depressions.

V.—PHYSIOLOGY.

(Translated by WM. C. AYRES, M.D.)

a.—GENERAL PHYSIOLOGY: CORNEA, IRIS, REFRACTIVE MEDIA.

582. ABADIE. Leçons sur la nutrition de l'œil. *Gaz. des Hôp.*, 1881, Mai.

583. ALBINI. Tavole per le prove attiche in oculistica. Napoli, 1881.

584. DEUTSCHMANN. On the physiological chemistry of the fluids of the eye. *Arch. f. Ophth.*, vol. xxvii, 2. In the fresh aqueous humor there is 0.03 of albumen. In the vitreous there is much more than in the aqueous. It increases in both after death; more rapidly in the aqueous.

585. EMMERT. The mechanism of accommodation of the eye. *A. f. A.*, vol. x, p. 407.

586. PFLÜGER, Des oscillations artificielles de la tension intraoculaire à l'état physiologique. *Internat. Ophth. Congr. in Milan*, p. 197. Atropine reduces the intra-ocular tension. Eserine increases it; also the continuous current. Experiments to be continued.

587. SAMELSOHN. Currents of fluid in the lens. *Klin. Monatsbl. f. Augenheilk.*, p. 265. The currents in the eye which come from behind forward seem to slacken in Petit's canal, and from there to enter the body of the lens, at its equator. In a centripetal manner they go through the whole lens, and collect at the anterior pole. From this point the fluids pass centrifugally toward the insertion of the zonula, leaving the lens and flowing into the posterior chamber.

588. SCHÖN. The aplanatism of the cornea. Contributions on the occasion of the jubilee of Prof. Horner. Wiesbaden, 1881.

b.—RETINA, OPTIC NERVE, CENTRAL ORGANS, MUSCLES.

589. AYRES, WM. C. The physiology of the visual purple. *New York Med. Journ.*, 1881.

590. DU BOIS-REYMOND. On the number of circles of sensation in the fovea centralis. Inaug. diss., Berlin, 1881. (1) The maximum number of points which can be distinguished is not more than half the number of cones. (2) If the entire number of cones is reached, the intermediate spaces become invisible. (3) In the fovea centralis, the number of the circles of sensation is

equal to that of the cones. (4) In one case the number of cones in 0.01 □ mm. was 152.

591. BUTZ. Preliminary communication on the examination of the physiological functions of the periphery of the retina. *Arch. f. Anat. und Phys., Phys. department*, 1881, vol. 5. The sensibility to light of every wave length increases from the centre toward the periphery up to 30°, then decreases more or less rapidly according to the kind of light. The increase in the sensibility to all kinds of light varies; in the most peripheric part of the retina it is highest for violet, and lowest for red.

592. CAMUS. Les cibles (targets) et l'acuité visuelle. *Recueil de Mém. de Méd., de Chir. et de Pharmacie Méd.*, 1881, März-April.

593. GOLTZ. The functions of the cerebrum. *Gesam. Abhand.* Bonn, 1881. The supposition of circumscribed centres in the cerebral cortex, with special functions, is untenable, consequently there is no part of the cerebrum which is distinctly set apart for vision. The visual disturbances which occur after traumata to one side of the cerebrum, are symptoms of a general dulness in all the senses, and are caused by a general intellectual dulness. Goltz proposes the term "cerebral diminution of sight, or cerebral amblyopia."

594. KÜHNLE and STEINER. Electrical phenomena in the eye. *Arch. of the Phys. Institute in Heidelberg*, vol. iv, 1 and 2.

595. LANDOLT. Des fonctions retiniennes. *Arch. d'Ophth.*, vol. 1, 3. The retina has three functions: the perception of light, color, and form. That of light is distributed over almost the whole retina equally; only in a small part around the fovea centralis it is somewhat greater. Perimetrically it extends outward 100°, inward 60°. The color-perception decreases rapidly toward the periphery, but by higher intensities of light colors are recognized to the limit of the field of vision. Perception of form decreases rapidly toward the periphery, so that at 50° from the point of fixation they are no longer recognized. The cause is want of practice.

596. PARENT. Optométrie ophtalmoscopique à l'image renversée. *Rec. d'Ophth.*, 1881, Sept. Refraction can be determined in the inverted image in two ways. (1) By gradually moving the object lens to or from the eye, and noticing the change in the size of the image. In emmetropia it remains the same whether the lens is held nearer to or further from the eye. In hyperopia the size of the image decreases when the object lens is removed from the eye examined. In myopia it increases under the same conditions. (2) By observing the parallactic displacement, in comparison to a certain amount of upward motion of object lens. If we move the lens in the vertical plane, the image changes as follows: in emmetropia to an equal extent; in myopia to a lesser extent; in hyperopia to a greater extent. If we place certain glasses before the eye examined, and make these experiments, we can almost tell the amount of the anomaly of refraction by trying until the motions correspond to what they should be in emmetropia.

597. PARINAUD. Sensibilité oculaire. *Progrès Méd.*, No. 26.

598. PARINAUD. L'héméralopie et les fonctions du pourpre visuel. *Gaz. Méd.*, No. 34.

599. QUIOC. Mémoire sur la déviation conjuguée des yeux et de la rotation de la face. Paris, 1881. Delahaye, p. 46.

600. SAMELSOHN. Incongruence of the retinae. *Deutsche med. Wochenschr.*, June 4, 1881.

601. SCHIRMER. Makropsia and mikropsia. Lexicon article. *Real-Encyclop.*, vol. viii.

602. SCHÖN. Venous pulsation in the retina. *Klin. Monatsbl. f. Augenheilk.*, p. 345. 1. Venous pulsation is a phenomenon of impediment. 2. The exit of the usual quantity of venous blood is diminished by compression. 3. The pulsation is brought about by arterial pulsation. 4. The region in which this happens must include the optic nerve up to the lamina cribrosa.

603. TSCHERMAK. The physiology of eye. The **Plateau-Oppel phenomenon**, and its position in the series of homogeneous phenomena. *Militär-med. Jour.*, June-July, 1881. After observing a rectilinear or circular motion for a long time, we can see a contrary after-motion in stationary objects. The apparent motion is only to be seen on the edges of the object observed. It appears in the centre as well as at the periphery of the retina. It is, however, necessary that we look steadily at one point of the moving object. The after-motion does not make the impression of an actual displacement, but more as if a cloud was moving over the object. The after-motion is not continuous, but periodical. The rapidity and duration of the after-motion increase up to a certain point with that of the inducing motion. Tschermak furnishes the following explanation. The motion of the image on the retina causes an unequal excitation at the anterior and posterior edges of the image. This irregularity causes an irregularity in the phases of the after-image. In front the positive after-image causes contrast, while behind the negative after-image induces a corresponding induction. As the result of this irregularity, the induction-wave in the first motion can only go backward (or in the opposite direction). The motion of the wave is transformed in the field of vision into a real motion in the opposite direction. The phenomenon therefore belongs to the class of after-images, and, strictly speaking, ought to be called reversed after-motions.

C.—COLOR-PERCEPTION.

604. BJERNUM. Hemianopia for colors. *Dansk. Hosp. Tidende*, Jan. 18, 1881. Total color-blindness in the left half of the field. The margin passed precisely through point of fixation in a vertical direction. There was an acute brain trouble, at least the patient complained of a severe headache, and died suddenly. He was 39 years old. Unfortunately there was no *post-mortem*. Bjernum cites this case in upholding a theory of the existence of a color centre. (Samelsohn reported a similar case in November of this year.)

605. BRAILEY. Report of the committee of the Ophthalmological Society on color-blindness. *Trans. Ophth. Soc.*, vol. i, p. 191. *Brit. Med. Jour.*, April 23, 1881. *C. f. A.*, Sept., p. 289. There were 18,088 patients examined—16,431 men and 1,657 women—with Holmgren's worsteds test. Of the men, 949 were Jews, showing 4.9 per cent., and 491 Quakers, showing 5.9 per cent.; 145 deaf-mutes with 13.7 per cent. of color-blindness. Of the remaining 14,846 men (of all conditions) there were 3.5 per cent. color-blind. Among the

women there were 730 Jewesses with 3.1 per cent., 122 deaf-mutes with 2.4 per cent., and 216 Quakers with 5.5 per cent. Among the remaining 489 women, 0.4 per cent. were color-blind. This unusual number among women is explained by the fact that Brailey says that in them it was not very pronounced. It was first doubted in the reference in the *Centralblatt*, and absolutely contradicted by Cohn, of Breslau, that such a difference is found between the higher and lower classes, as Brailey says that in the lower classes he found 3.7 per cent., and in the higher only 2.5 per cent. All who could not distinguish the paler shades were classed as slightly color-blind; those who confounded red and green as pronounced. There were 615 of the latter class, and 3 cases of total color-blindness. It was very seldom that blue and violet were mistaken for one another. Those who compared pink with deep blue, or violet and scarlet with dark green were considered red-blind. Those who compared pink with gray or green, and scarlet with light green or light brown, were considered green-blind. The red-blind had no perception of light coming from the distance through a red glass, while those who were green-blind distinguished it perfectly. Red-blindness appears to be somewhat more frequent than green-blindness in England. The intelligence of the person had no connection with the color-perception. It was hereditary.

606. CARRERAS-ARAGÓ. El Daltonismo y los alteraciones visuales en las empleadas de las ferro-carriles. *Rev. de Ciencias Med.*, August.

607. CARTER. On color-blindness. *Med. Times and Gazette*, June 11, 1881, p. 654. Three lectures delivered at the Society of Arts. In the third lecture C. advocates legislation as regards seamen and railroad employés.

608. DONDEERS. Sur les systèmes chromatiques. *An. d' Oc.*, Sep., 1881. *A. f. Ophth.*, vol. xxvii, 1. The first part is principally historical. He argues against Hering's theory, and also for the separate condition of a red- and a green-blindness. There are four primary colors: red, yellow, green, blue; and 5-6000 color impressions.

609. DOR. Perception of colors. Intern. Med. Congr. in London. These ARCHIVES, x, p. 339. The perception of colors takes place in the brain or optic nerve, but not in the retina.

610. DOR. De l'état actuel de nos connaissance sur le Daltonisme. *Intern. Ophth. Congr. in Milan*, p. 179. Discusses the priority of Holmgren's method. As early as 1859 he used a similar method, employing the same test colors. Since he did not publish it, Holmgren could not have known it. He rejects the classification into red-, green-, and violet-blindness, and admits five kinds: total color-blindness; red-green blindness, with normal or shortened spectrum; blue-yellow blindness, with normal or shortened spectrum. Holmgren's method is not a certain one. Rejects the Young-Helmholtz's theory. Delbœuf's cure for color-blindness is in reality no cure.

611. DE FONTENAY. Om. farvesansquelser. *Hospitals-Tidende*, July 28, 1881. Recommends a systematic education of the color-sense in school.

612. DE FONTENAY. Kontrol med Farveblindheden. *Hospitals-Tidende*, Sept. 14, 1881. He examined 2,737 men, finding 3 per cent., and 502 women with 0.6 per cent. of color-blindness in railroad employés. (See another paper

by the same author, based on the examination of 9,659 persons. These ARCHIVES, vol. x, p. 8, etc.)

613. GALEZOWSKI. Daltonisme pathologique ; communication faite à la Soc. de Biologie. *Gaz. des Hôpit.*, May 31, 1881.

614. GEISSLER. On color-blindness. A review of the newest investigations. *Schmidt's Jahrbücher der ges. Medicin.*, vol. cxc, 1.

615. HOLMGREN. One-sided color-blindness. *Upsala läkaref. förhandl.*, vol. xvi, 2-4.

616. JÄGER. Method of educating and developing the color-sense. *Natur*, No. 47. Recommends the system of Magnus.

617. JEFFRIES. On the expression of color-blind people. Americ. Ophth. Soc. at Newport, July 27-28. Their expression is restless and anxious, aimless, etc.

618. JEFFRIES. On some points in regard to color-blindness *Journ. of Nervous and Mental Disease*, July, 1881. Jeffries contests the assertion of Bannister that color-blindness can have no practical bearing in railroading, it being a well-known fact that color-blind people can perfectly distinguish colored signals.

619. KAISER. Association of words with colors. *A. f. A.*, vol. xi, 1.

620. KEERSMAECKER. Le Daltonisme et les altérations du sens visuel en général chez les agents de l'administration des chemins de fer. Rapport présenté à M. le Ministre des Travaux Publics, Bruxelles, 1881. Compare report of *Internat. Ophth. Congr. in Milan*, p. 193. Railroad employés should be examined by surgeons of the company : 1, in regard to their vision (uncorrected) by artificial light ; 2, their color-perception for the woollen tests ; 3, their field of vision, both for the hand and the color tests. If any thing abnormal is discovered by such tests, the person should be brought before a commission, consisting of three railroad directors and an oculist, and tested with Keersmaecker's chromoptometer. He closes with remarks on the dispute between Warlomont, Moeller, and Keersmaecker.

621. KOLBE. Color-blindness, and its relations to practical life. *Neue Dörpt'sche Zeitung*, July 10 and 11, 1881.

622. KRONER. The Talmud and colors. *Augsburger Allg. Zeitung*, No. 256.

623. MACÉ ET NICATI. Contribution à l'étude du **champ visuel des couleurs**. *A. d'Ophth.*, vol. i, p. 506. A red, a green, and a blue glass is held successively before the eye, and it is determined how far a white piece of paper can be distinguished on the perimeter. The field for red is most contracted on gradually diminishing the intensity of light. Atrophy of the optic nerve and glaucoma show the narrowest field for red, by good illumination; and also the most pronounced reduction of central vision, when a red glass is held in front of the eye. In alcoholic amblyopia the central scotoma for red is the most pronounced.

624. MANZ. Remarks on color-perception. *Archiv f. Anthropolog.*, vol. xiii, Aug. 31, 1881. M. criticises the publications of Almquist, Günther, and Magnus.

625. MARÉCHAL. Appareil pur la détermination de l'acuité visuelle et de la vision des couleurs. *Internat. Ophth. Congr. in Milan*, p. 244. Also Amsterdam Cong. in 1879.

626. MAUTHNER. On colored shadows. Color tests, and acquired erythrochloopia. *Wiener med. Wochenschr.*, 1881, Nos. 38 and 39. M. combats Stilling's method of determining color-blindness by colored shadows. He shows that color-blind people can distinguish the shadows when properly produced. The proper way, he says, is that one source of light should send out white light (not an artificial light), and the other a simple colored light. Since Stilling neglected these precautions he did not use the method properly. Mauthner's test with the colored powders, as far as the principle is concerned, is the best, but its application has unavoidable difficulties. As to Stilling's tables, he says: The tracing of the letters is so difficult that he admires the courage of any one who establishes color-blindness in those who do not read the letters. As to Cohn's assertion that Stilling's new table II is the best method of determining color-blindness, M. remarks, that independent of the inutility of the tables, this recommendation is peculiar, since this table II was only printed as an experiment, and according to Stilling's own assertion was not intended for publication, and was only produced on account of an error in the other tables. M. thinks that the problem of the pseudo-isochromatic letters is insoluble.

627. Methodical education of the sense of color. *Kindergarden Messenger and the New Education*. Official organ of the American Froebel Union, Syracuse, Sept., 1881. Recommends the method of Magnus.

628. OLE BULL. A new method of examination and numerical determination of the sense of color. *Internat. Med. Cong. in London*. These ARCHIVES, vol. x, p. 337. A color plate is used. The method is based on a uniform pureness and intensity of four primary colors, viz.: red, green, yellow, and blue. There are six shades of these colors divided off, so that each one of them can be rotated on Maxwell's wheel with gray of the same intensity, and also with its complementary color. The shades are then reproduced in pigment and combined on a table. The table contains eighty shades of color in all. The method of examination is according to Holmgren's principle, viz.: that the patient is shown a colored or uncolored quadrant, and is desired to pick out another similar to it. The table is held at one metre from the person examined. B. refers to a similar table published by Bruno Kolbe.

629. PARINAUD. Des modifications pathologiques de la perception de la lumière, des couleurs, et des formes, et des différentes espèces de la sensibilité oculaire. *Gaz. Méd.*, No. 29.

630. PIERD'HOUY. Une visite aux aliénés de la province à Mombello. *Internat. Ophth. Congr. in Milan*, p. 162. In Italy Daltonism is not so frequent as in Northern Europe. This is due to climatic and geographical influences, and also to the great vocabulary of words denoting colors. Among 900 insane persons there was not one case of Daltonism. Violet was the color, distinguished with most difficulty. A majority of those suffering from melancholia shrank from bright colors.

631. PFLÜGER. On the diagnosis of color-blindness. *C. f. A.*, July. According to P's. earlier investigations Holmgren's method is not a sure one. In two army surgeons who were color-blind, it could not be detected according to it, but they could not read Stilling's tables.

632. PFLÜGER. Polariscopes. *Internat. Ophth. Cong. in Milan*, p. 179. The quantitative excitability of the centre of the retina by homogeneous light was determined with polarized colors produced by Rose's apparatus.

633. PFLÜGER. Further observations on color-blindness. *A. f. A.*, vol. xi, 1.

634. RICHI. Sur la question de la cécité des couleurs. *Internat. Ophth. Cong. in Milan*, p. 217. Color-perception is more acute in southern countries than in northern. The examination of railroad employés should be made by an oculist, and not by a general physician.

635. ROBERTS. Detection of color-blindness and imperfect eyesight. London, 8, No. 6.

636. SANROMAN. Estudios sobre el Daltonismo aplicado à la navegacion. *Bolet. de Méd. Naval*, No. 9.

637. SCHENKL. On the diagnosis of red-green blindness. *Prager med. Wochenschr.*, 1881, Nos. 19-27. Holmgren's method is recommended. Magnus' table in conjunction with the woollen test is useful. Stilling's new table not convenient. The diagnosis of color-blindness is not made with certainty according to Stilling's new table II, which Cohn recommends too highly. Mauthner's modification of Donders' pseudo-isochromatic test is to be recommended. Cohn's embroidered letters are not good. Daae's table may be used, but is difficult to understand for people of low intelligence. Mauthner's powders are highly recommended. Stilling's colored shadows are not easy of application, since color-blind people may recognize colored shadows. Pflüger's table in combination with woollen tests useful. Successive contrast looking-glass reflections not trustworthy. Reports an exquisite case.

638. V. SEYDEWITZ. On color-blindness and the development of the color-sense. *New Orleans Med. Journ.*, vol. ix, 2, Aug., 1881.

639. STEFFAN. Contribution to the pathology of color-perception. *A. f. Ophth.*, vol. xxvii, 2. From clinical reasons S. considers that there is a bilateral color centre in the gray substance of both occipital lobes of the brain. Accordingly the seat of congenital color-blindness must be in the brain; it can also be caused by certain conditions which lie exterior to the chiasm, either in the optic nerve or in the retina. Reports an exquisite case.

640. STILLING. Sur la détermination pratique du Daltonisme. *Intern. Ophth. Cong. in Milan*, p. 187. He distinguishes: 1. A red-green blindness with normal quantitative perception for red; in this the spectral red appears yellow. 2. Red-green blindness with a shortened spectrum at the red end (red-blindness); in this the spectral red seems black. 3. Blue-yellow blindness with normal quantitative perception of blue. 4. Blue-yellow blindness with shortened spectrum at the blue end. It is of no importance whether we use Holmgren's woollen tests, or the pseudo-isochromatic tables, if we only use the true confusion colors.

641. SZILÁGVI. On monocular mixing of colors. *C. f. d. Med. Wissensch.*, 1881, No. 28. Two crown-glass prisms (4° – 8°) so placed that their refractive angles touch each other, form a suitable apparatus for monocular mixing of colors. In thus mixing two complementary colors phenomena are produced resembling those of the binocular struggle for preponderance.

B. ANOMALIES OF REFRACTION AND ACCOMMODATION, LIDS, LACHRYMAL APPARATUS, MUSCLES AND NERVES, ORBIT AND NEIGHBORING CAVITIES, CONJUNCTIVA, CORNEA, SCLEROTIC, AND ANTERIOR CHAMBER.

BY DR. C. HORTSMANN.

Translated by WILLIAM C. AYRES, M.D.

I.—REFRACTION AND ACCOMMODATION.

642. MEYER. Myopia in the schools of different nations. *Rev. méd. franç. et étrang.*, Feb., 1881.

643. COLLARD. The condition of the eyes of the students of the university in Utrecht. *Nederland Gasthuis for Ooglijders*; vol. xxii, p. 73.

644. NETOLICZKA. Myopia in the students of the Grazer intermediate school. xxx. Report of the Steiermärk'sche Landes-Ober-Realschule.

645. S. D. RISLEY. Weak eyes in the public schools of Philadelphia. *Phil. Med. Times*, July 30th. There were 2,422 scholars examined. In the lower classes R. found 4.27 per cent. of myopes,—the frequency increasing as the classes were higher. Myopia was not so frequent as in the European schools. There was a larger percentage of diseases in myopic eyes than in emmetropic and hypermetropic; myopic astigmatism was more frequent than simple myopia. The number of hyperopes was larger than that of the myopes and emmetropes combined. The methods of education had a great influence on the occurrence of progressive myopia.

646. BURGL. On testing the vision of recruits. *Deutsche Militär-ärztliche Zeitschr.*, H. 7, p. 148. The author recommends the *optometric* method in testing both the power of vision and the refraction of the eyes of recruits.

647. WARLOMONT. On the use of the optometer in examining the eyes of soldiers and of railroad employés. *Brit. Med. Journ.*, March 5th.

648. E. BRÖCKMANN. A trial case with combination glasses. *Norsk Mag.*, vol. ii, 3, p. 209. The case contains 14 glasses by a combination of two of which all convex and concave spherical glasses from 0.5 to 20 D can be produced.
BULL and SCHJÖTZ.

649. PARENT. Ophthalmoscopic optometry in the inverted image. *Recueil d'Ophthalm.*, Sept., p. 544. P. recommends the study of the deter-

mination of refraction by the inverted image, by successively moving the object glasses to and from the eye and observing the change in the size of the papilla, or by determining the position of the image in regard to the position of the object lens.

650. LEROY. The theory of astigmatism. *Arch. d' Ophthal.*, vol. 1, 4, March-April.

651. AYRES, WILLIAM C. Notes on the focal lines in astigmatism. *N. Y. Med. Journ.*, Nov. A. attempts to account for the shorter radius of curvature of the normally as well as the abnormally astigmatic eye being in the vertical meridian by the manner in which the lids are developed. He gives no explanation, however, of those quite numerous cases where the two principal meridians are placed otherwise. He then gives an explanation of the formation of the vertical and horizontal *lines* by the two principal meridians. If the apex of a triaxial ellipsoid is cut by planes perpendicular to its surface in the manner of the spokes of a wheel, the sections will have a twisted surface and the rays of light at homogeneous points will not come to a focus except in the two principal meridians. This is shown by Knapp's thread and wax models. If, however, the planes cut the surface parallel to one of the principal meridians they will represent parts of an ellipsoid with a regular surface which can bring rays to a focus. As, however, the curvature of the triaxial ellipsoid varies as we move from the axis in the direction of each of the principal meridians, the foci of each of these regular ellipsoids will be found at a separate place, but they will all be in a line corresponding to the meridian at right angles to the one in which the rays fall on the surface. In his experimental efforts to verify this, however, by means of Hering's artificial eye, made astigmatic by means of a cylindrical lens placed in front of it, he does not mention the fact that the actual condition of the astigmatic eye is not represented, since we have to do in this case not with a triaxial ellipsoid but an ellipsoid with only two axes. In the triaxial ellipsoid the radius of curvature varies at every successive point even in the principal meridians, and in such a manner as to increase the spherical aberration. Strictly speaking, therefore, it would be impossible for such a surface to form a clearly defined straight line in either focal plane. The focal lines under such circumstances must of necessity be curved. AYRES.

652. LANDESBURG, M. On the occurrence of regular astigmatism in certain anomalies of refraction and accommodation. *Gr. Arch. f. Ophthalm.*, vol. xxxii, 2, p. 89. In certain cases of myopia with or without spasm of accommodation, and hyperopia with spasm of accommodation, L. observed regular astigmatism as a result of the accompanying anomaly of refraction or accommodation. It disappeared under proper treatment of the primary affection.

653. SCHIESS-GEMUSEUS (*Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 384). S.-G. observed the occurrence of myopia after a contusion of the left eye by a cork. It was produced by the advancement of the lens, from the trauma, and disappeared after a lapse of 8 weeks.

654. FERRUCIO and ALBERTOTTI. Changes in refraction after emptying of the anterior chamber. *Annal. di Ottalm.*, 1881, Fasc. iii. After emptying of the anterior chamber the refraction increases in an eye with a lens, but

decreases in aphakia. The change of refraction is proportionate to the extent of the exit of the aqueous humor. The cause of this is a flattening of the cornea, and also an advancement of the lens. In aphakia the reduction of refraction is due to the simple flattening of the cornea.

655. SÉDAN. (*Rec. d' Ophthalm.*, Aug., 1881.) S. recommends the use of homatropia in progressive myopia.

656. ALEXANDER. **One-sided paralysis of the sphincter pupillæ and of accommodation, caused by syphilis.** *Deutsche Med. Wochenschr.*, No. 41. Unilateral mydriasis with paralysis of accommodation is generally of a syphilitic origin; the condition belongs to the later symptoms of the disease. The earlier effects of lues are not so bad and pass off quicker; it is in itself incurable, is of a cerebral nature, and must be looked upon as a precursor of psychical disturbances. In 35 of such cases, syphilis was certain in 25, doubtful in 5, while it could be excluded in only 5.

657. CHISOLM. Spasm of the intra-ocular muscle. *Independ. Practit.*, Feb., 1881, Baltimore.

II.—LIDS.

658. DELAPERSONNE. **Palpebral shanker.** *Arch. d' Ophth.*, vol. i, p. 499. D. reports 3 cases of shanker of the lids. In the first case the inner canthus and the caruncle were the seat of the lesion, and in both the others it was on the under lid. Cure in all three cases. V. MITTLESTÄDT.

659. VELARDI. Un caso di alopecia ciliare alterna. *Boll. d' Ocul.*, vol. iii, No. 12. A girl 16 years of age suddenly lost her eyelashes after a severe attack of headache. It is remarkable that she lost those of the upper lid of the right eye and those of the lower lid in the left. They grew out again in one month, and have since remained. DANTONE.

660. SALTINI. On the inoculation of chalazia to rabbits' eyes. *Ann. di Ottalm.*, 1881, Fasc. 4. The results were negative.

661. ARMAIGNAC. Simulated chromhidrosis. *Journ. de Médecine de Bordeaux*, April 17, 1881.

662. FOX. Two cases of chromhidrosis. *Lancet*, i, No. 23.

663. BRECHENNIER. Œdème malin des paupières traité par les injections iodées après une cautérisation sans résultat. *Progrès Médic.*, No. 11, p. 202.

664. BUY. De l'œdème malin ou charbonneux des paupières. *Thèse de Paris*, 1881.

665. KNAPP, H. Hemorrhagic infarction of the upper eyelid. *Med. Rec.*, vol. xix, No. 8, p. 216.

666. JACOBI. Angiosarcoma of the eyelid and temple. *Med. Rec.*, vol. xix, No. 8, p. 217.

667. LANDESBURG. Epithelioma of the eyelids. *Med. Bull.*, May, 1881. L. reports three cases of epithelioma of the upper lid which were treated by chlorate of potash in powdered form. All three resulted in cure. BURNETT.

668. STORY. *Brit. Med. Journ.*, April 23, 1881. S. reports a case of sarcoma of the lid.

669. LAWLON, G. A case of primary epithelioma of the lower lid. (Roy. Lond. Ophth. Hosp. Rep., vol. x, 2, p. 200, June, 1851.) In his remarks L. gives the points of differential diagnosis between rodent ulcer and epithelioma. He is satisfied "that rodent ulcer, if left, will in time so change its character as to become true epithelioma." Whether this is due to a mere progress of the disease, or that rodent ulcer is peculiarly apt to have superadded to it the characters of epithelioma, he cannot say. He gives an illustrative case.

FITZGERALD.

670. ABADIE. Rare symmetrical tumors of the lids. *Arch. d' Ophth.*, vol. i, p. 432. A girl 16 years old had very hard symmetrical tumors about the size of a hazel-nut on the outer part of the upper lids. They were in connection with the tarsus, and extended deep into the orbit. The skin and conjunctiva were intact. The diagnosis of adenoma of the lachrymal glands was made; one was removed with a part of the tarsus. Two examiners declared it to be tuberculous. Two months after, grave lung symptoms occurred, and the tumor on the left side was removed, which was also tuberculous.

The recovery was good, and the lung symptoms disappeared. She has retained her health for three years. A. does not consider it certain that the tumor was tuberculous, since the microscope alone cannot decide the question.

V. MITTELSTÄDT.

671. COGGIN. The growing in of the eyelashes. *Boston Med. Journ.*, vol. civ, 2, p. 32, Jan.

672. CASTOMYRIS. A method of curing trichiasis. *Ans. der Ges. der Aerzte in Wein*, 1881.

673. PRATOLONZO, PIETRO. On the cure of entropion. *Boll. d' Oculistica*, anno iii, No. 7, p. 92.

674. JOUIN. A simple method of treating entropion due to spasm of the orbicularis. *Revue méd. franç. et étrang.*, March 22, No. 11.

675. BÖCKMANN, E. Entropion operation. *Norsk Mag.*, vol. ii, 3, p. 209. When the under lid is entropionized, B. put two needles on a thread and fixed them in the same needle-holder, about 1-2 mm. apart. He then stuck the two needles into the under edge of the tarsus from the conjunctival side. The outer skin is drawn down as much as possible. The needles are then passed through the eyelid and the threads securely tied. He applies one or several such sutures according to the extent of the entropium.

BULL and SCHJÖTZ.

676. ELY, E. T. A successful case of transplantation of the skin according to Wolfe's method. *N. Y. Med. Journ.*, March 12, 1881. In consequence of a cicatrix the under lid was attached to the cornea. The upper part of the cornea was clear. The lid was detached from the eyeball and brought into its normal position. The defect in the lid was covered with a piece of skin 1' long and $\frac{3}{4}$ ' broad from the lower part of the arm. Healing took place *per primam*.

BURNETT.

677. ALT, A. An improved method of operating on certain conditions of symblepharon. *These ARCH.*, vol. ix, p. 293. In a case of symblepharon where the lower lid was attached to the lower part of the cornea, caused by melted iron. The lid was detached until the globe resumed its nor-

mal motions. Conjunctival flaps were then made from the nasal and temporal sides, reaching to the periphery of the cornea. These were long enough to be united by sutures over the middle of the defect. To protect the fornix both the inferior angle of the conjunctival flap were sewed to the lid by sutures, which passed through the tarsus and were fastened on the outer surface of the lid by beads. The healing was good. Notwithstanding the necessary diminution, the conjunctival sac had a depth of 5 mm. after three months. The globe retained its normal motions.

678. BERGER. Autoplasty by transplantation. *Prog. Méd.*, No. 31, 1881.

679. PANAS. Stretching of branches of the trigeminus as a treatment for painful blepharospasm. *Arch. d'Ophthalm.*, vol. i, p. 385. On account of an intermittent neuralgia of the first and second branch of the trigeminus and blepharospasmus, PANAS stretched these nerves. The supra-orbital nerve was broken, and a piece 4 mm. long was removed. After the stretching the pain disappeared immediately in the region supplied by these nerves, and also the blepharospasm. Seven weeks after the stretching of the infra-orbital nerve, the anæsthesia in the region supplied by the nerve was on the decline. While there is complete anæsthesia after the stretching, there are after the division radiating pains for several days. V. MITTELSTÄDT.

680. BAUDRY. Note on a case of emphysema of the lids and orbit. *Rec. d'Ophthalm.*, Aug., 1881. B. tries to prove that emphysema of the lids, which sometimes occurs after violent sneezing or nose-blowing, is caused by a fracture of the inner bony wall of the orbit. In this way air passes from the nose directly into the tissue of the lids and orbit. MARCKWORT.

681. NUEL. A case of coloboma of the upper lid and the eyebrows. *Arch. d'Ophthalm.*, vol. i, p. 437. The case is similar to that of Manz. *Arch. f. Ophthalm.*, vol. xiv, 2. V. MITTELSTÄDT.

682. v. REUSS. Hordeolum. *Eulenberg's Real-Encyclopedia*, vol. vi, p. 584.

III.—LACHRYMAL APPARATUS.

683. LOPEZ OCAÑA. The diseases of the lachrymal passages. Madrid, 1881.

684. ARMAIGNAC. Remarks upon the etiology and therapeutics of the diseases of the lachrymal passages. *Revue d'Oculist. du Sud-Ouest*, vol. ii, No. 12, p. 265.

685. LAREBIÈRE. Contribution to the study of syphilitic diseases of the lachrymal canals. *Thèse de Paris*, 1881.

686. BOISSON. Chronic dacryocystitis and its treatment. *Thèse de Paris*, 1881.

687. MAUREL. A metrical *filière* (gauge) for the catheterization of the lachrymal canals. *Bull. Génér. de Thérap.*, Feb. 15, 1881.

688. ARMAIGNAC. The extraction, by a new method, of a piece of a silver probe, which had remained in the lachrymal canal. *Revue d'Oculist. du Sud-Ouest*, vol. ii, No. 11, p. 241.

689. OTT. Inflammation of the lachrymal gland terminating in supuration. *Rec. d'Ophth.*, Aug., 1881. In a girl 5 years old there had been swelling of the lid of the left eye with chemosis for 5 days. Since the tumor increased and showed fluctuation it was opened. By a deep incision a large amount of pus was evacuated. The above symptoms diminished and the inflammation ceased at the end of 7 days. From the situation of the tumor, the time which the pus required to collect, and the depth of the collection, the lachrymal gland was considered the seat of the disease. MARCKWORT.

690. SCHREIBER. On the extirpation of the lachrymal sac. *Gr. Arch. f. Ophth.*, vol. xxvii, 2, p. 283. Extirpation of the lachrymal sac is indicated in the following conditions: in obliteration of the nasal duct and hydrops of the sac; in obstinate dacryoblenorrhœa with stenosis of the nasal duct of long standing, even if the canal can still be sounded; when there is a slight tumefaction in the region of the sac, and thickening of its walls; also in fistula of the lachrymal sac, where the skin is grown together with the walls of the sac on account of a frequent recurrence of a phlegmonous condition; in old catarrh of the sac, since it mostly leads to polypoid proliferation of its mucous membrane. In this condition it is indicated if the canal is perfectly free.

The operation is done in the following manner: At a distance 4 mm. from the inner canthus make an incision through the skin 2 cm. long. The sac is laid bare, and can be extirpated with a small pair of Cowper's scissors. If any of it remains, it must be removed, with Volkmann's sharp spoon, down to the bone. Also scrape off the mucous membrane of the nasal duct as far as possible. The whole operation and after-treatment must be antiseptic. Results after the method of treatment were always good. (The obliteration of the sac with nitrate of silver is far more simple, is commonly followed by a smooth recovery, and the scar is scarcely perceptible.—KNAPP).

IV.—MUSCLES AND NERVES.

691. FAUCHERON. Supra-orbital neuralgia and its influence on the eye. *Rec. d'Ophth.*, 1881, Nos. 2 and 3. If the supra-orbital nerve is cut it has no effect on the eye. If it is otherwise excited, we find such effects as lachrymation, injection of the conjunctiva; later, photophobia and a certain amount of loss of sight.

692. MORSAIS. On the treatment of strabismus. Paris, 1881.

693. WILSON. A case of strabismus convergens. *Phil. Med. and Surg. Report.*, vol. xlv, 10, p. 263.

694. PRINCE, A. E. Contribution to the correction of strabismus by the advancement of the rectus. *St. Louis Med. and Surg. Journ.*, June, 1881. He describes a modification of advancement.

695. HARLAN (Rep. Americ. Ophth. Soc., 1881). H. describes a case of intermittent strabismus convergens in a boy 3 years old. BURNETT.

696. BRAILEY, W. A. A rare form of muscular asthenopia. *Trans. Ophth. Soc. of United Kingdom*, vol. I, p. 188, 1881. A man, 30, of literary habits, had for years had a smarting, "painful cramp" of the eyes from near work; slight compound my. ast. with normal accommodation and vision. Internal recti—34° prism; external recti—6°. Lateral double images produced

by 5°. Prisms always showed also a slight *vertical* displacement, overcome by prism 5°. By wearing prisms 3° base upward to left eye, with correcting cylinders, his symptoms were removed, and even the vertical prism alone latterly gave the same result. No ordinary glasses were so useful. E. NETTLESHIP.

697. THEOBALD (Americ. Ophth. Soc., 1881). Discussed insufficiency of the recti interni.

698. SCHENKL. Congenital incomplete development of the levator palp. sup., the rectus ext., the rectus int., rectus sup., and inferior oblique muscles in both eyes. *Centralblatt f. Pract. Augenheilk.*, 1881, p. 335. A strong, healthy man, 26 years old, of a healthy family, had normal vision, but suffered from a congenital, incomplete development of the above muscles, in both eyes. Accommodation normal, slight hypermetropia, with S— $\frac{1}{2}$.

699. OGLESBY, R. On nystagmus. *Brain*, vol. iii, p. 160.

700. LAWSON, G. Voluntary nystagmus. *Royal London Ophth. Hosp. Rep.*, vol. x, 2, p. 203. A curious case, the second L. has seen. The movements were really an exaggeration of what is seen in lateral nystagmus, but were so rapid that the margins of the cornea could not be defined. FITZGERALD.

701. EALES, HENRY. Miners' nystagmus. *Brit. Med. Journ.*, vol. xlii, p. 159, July, 1881. E. discusses nystagmus in miners.

702. BOUCHAUD. Contribution to the knowledge of spasm of the ocular muscles, unilateral horizontal nystagmus. *Journ. des Sc. Méd. de Lille*, March, 1881.

703. HARLAN. Case of congenital paralysis of the sixth and seventh nerves on both sides. Rep. Americ. Ophth. Soc., 1881. H. describes a case of congenital paralysis of the abducens and obicularis. Vision was diminished on both sides, and not improved by glasses. Fundus normal, nor did the patient complain of diplopia. BURNETT.

704. STURGE, W. A. Two cases of simultaneous paralysis of both third nerves, with remarks on ophthalmoplegia. *Trans. Ophth. Soc.*, vol. i, p. 165, 1881. Case 1. A man, 72. Apoplectic attack; consciousness soon regained; paralysis of all third nerve muscles on right side, and all except levat. palp. on left; right old iritis, fundus normal, left pupil dilated and fixed, blindness from old choroiditis, fourth nerve doubtful, sixth nerve normal, paralysis of right fifth (sensory and motor) and facial, and deafness of right ear; complete paralysis of left arm and leg (both sensory and motor). Sphincters normal. Rapid and almost complete recovery of all parts *except the third nerve*. Hand recovered before arm, and arm before leg. Probably a small hemorrhage in the pons.

CASE 2.—Man, 16 years old; liable to headache, vertigo, and vomiting. Sudden apoplectic attack; unconscious for a day. Complete paralysis of all third nerve muscles on both sides; pupils varied in size from day to day, and when not dilated acted a little to light; a few days later paralysis of left sixth. Restlessness and pain in back, no material fever, no optic neuritis. Complete recovery with active but unequal pupils in 7 weeks. Probably a small hemorrhage at nuclei of origin of third nerves. Sturge discusses, ably and at length, the question of different types of ocular palsy from diseases of: 1, the nerve trunk; 2, nucleus of origin; 3, centres for bilateral co-ordinated move-

ments, of which several varieties may be expected, and are in fact met with : *a*, loss of a single co-ordinated action ; *b*, loss of nearly all movements, one or two co-ordinations remaining ; *c*, paralysis of co-ordination alone ; *d*, of dilator pupillæ, *e*, of sphincter pupillæ alone ; *f*, various mixtures of the above. He thinks both the cases recorded were instances of the second type (disease of nucleus of origin). E. NETTLESHIP.

705. BROWNE, EDGAR A. **Ophthalmoplegia interna.** *Liverpool Med.-Chir. Journ.*, July, 1881, p. 1.

Five cases are mentioned, of which syphilis had occurred in four, the interval varying from 3 to 12 years. Early treatment by iodide of potassium in doses as large as the patient can bear, and moderate mercurialization are insisted on. Three of the five cases recovered more or less completely. NETTLESHIP.

706. HULKE, T. W. **A summary of cases of ocular palsy, with comments.** *Ophth. Hosp. Rep.*, vol. x, 2, p. 148. H. has compiled 127 cases. Of these there was paralysis of the external ocular muscles alone in 84 ; same of internal muscles, 19 ; and both together affected in 24. He describes these groups separately, and points out their etiological relations. FITZGERALD.

V.—ORBIT AND NEIGHBORING CAVITIES.

707. PÉAU. **Fistula of the frontal sinus.** *Gaz. des Hôpitaux*, 1881, No. 9.

708. KNAPP. **Subperiosteal enucleation of an ivory exostosis of the frontal sinus, extending into the nasal and orbital cavities. Healing by first intention.** *These ARCH.*, vol. ix, p. 464. *Trans. N. Y. State Med. Soc.*, 1881, p. 244. Knapp removed subperiosteally an ivory tumor the size of a large walnut from the frontal sinus and adjacent cavities. About two thirds of the mass was in the frontal sinus and nasal cavity, and the remaining one third in the orbit. Its probable origin was the septum of the frontal sinus ; it afterward penetrated the walls of the nasal cavity and the orbit. It showed itself in the inner and upper angle, and extended to a few *mm.* below the lig. canth. int. It produced ptosis of the right upper lid, and often caused a stopping up of the right nostril. The removal of the tumor was indicated, since it had grown within four months. Healing followed by first intention without antiseptic treatment.

The paper published in the *Trans. N. Y. State Med. Soc.* treats of the whole subject, with abstracts of all the cases known thus far.

709. RICHET. **Abscess of the frontal sinus.** *France Médicale*.

710. BAYER. **The etiology of double-sided orbital phlegmon.** *Prager Med. Wochenschr.*, vol. vi, No. 23, 1881. B. reports two cases of double-sided phlegmon of the orbit after erysipelas of the face ; they seemed to uphold Leber's theory that such affections do not have an intracranial origin, but are extracranial. The first case resulted in death through infectious meningitis ; the second in recovery with phthisis of the right eye, while the sight in the left was but little reduced.

711. PASSIATORE. **Phlegmon of the retrobulbar adipose tissue.** *Revista Clinica*, 3 S., vol. i, 2, p. 152.

712. ADLER. **On inflammation of the orbital cellular tissue.** *Wiener*

Med. Bl., vol. iv, p. 736, 1881. A. describes a case of chronic phlegmon of the orbit on the right side, having its origin in a rheumatic affection, and producing temporary exophthalmus. In the next four years the exophthalmus returned and disappeared about ten times, causing gradual diminution of sight. It finally became stationary, leaving atrophy of the optic nerve. The globe was normal both as to motion and tension.

713. ANGELO. Stomma de periosto nell' angelo superiore della cavita orbitaria. Morgagni, April, 1881.

714. SOUS. General symptoms of tumors of the orbit. *Journ. de Méd. de Bordeaux*, 1881.

715. FANO. Treatment of tumors and fistulæ at the inner angle of the orbit. *Rév. méd. franç. et étrang.*, No. 13, March 26, 1881.

716. BULL, CH. STEDMAN. A contribution to the pathology of orbital tumors, being a study of the secondary processes in the periosteum and bones of the orbit and vicinity. *N. Y. Med. Journ.*, vol. xxxiii, No. 3, p. 267. Case 1.—Encapsulated orbital sarcoma; extirpation; return in the form of a myxosarcoma. It infiltrated all the bones of the orbit and of the face on the left side. Required three operations. Case 2.—Intra-ocular sarcoma; secondary infiltration of the optic nerve and the orbit. Required four operations. Case 3.—Fibrosarcoma of the orbit, including the periosteum and walls of the orbit, and also the bones of the face. Operation was not advised.

BURNETT.

717. NOYES. (Trans. Amer. Ophth. Soc., 1881.) N. reports two cases of large epithelioma of the inner angle of the orbit. He removed them and covered the defect in the skin by a flap from the forehead.

BURNETT.

718. LEDIARD. Epithelioma of the orbit and eyeball. *Trans. Ophth. Soc. of United Kingd.*, vol. i, p. 7, 1881. A man had a growth cut out of the lower lip at 70. There was, at the same time, a small spot on the right lower lid. A year and a half later this began to grow, æt. 74. L. found extensive ulceration of both right eyelids and granulations encroaching on globe. Removal of growth and eyeball, followed by use of chloride of zinc paste; exfoliation of portions of bone exposing the nasal cavity. Ten months later some gelatinous tissue deep in orbit, but no decided malignant return. The growth was histologically typical epithelioma.

E. NETTLESHIP.

719. TREITEL. Wound of the optic nerve in the orbit, with an intact globe and complete loss of sight. *Arch. für Augenh.*, vol. x, p. 464. A soldier was stuck in the eye with a sabre, and rendered blind immediately. Besides the external wound in the lid there was also paralysis of the inferior rectus. The pupil was dilated to a medium size, but did not respond to light. After fourteen days the papilla was atrophic. The globe was perfectly intact: no cerebral symptoms; the optic nerve must have been wounded within the orbit.

720. SANTOS, FERNANDEZ J. Amaurosis from lesions of the eyebrow or orbital region. *The Amer. Journ. of Med. Scienc.*, Jan., 1881. S. discusses the disturbances of sight after wounds in the orbital region. Some believe that the amaurosis is dependent upon the wounding of a branch of the trigeminus, others that it is due to rupture of the retina, or disturbances in the

brain and its surrounding. S. reports five cases of such wounds, with the following conditions of vision: Three cases which came under observation some time after the injury showed atrophy of the optic nerve; the other two were seen immediately after the accident, and in them the optic nerve was somewhat pale. None of them showed symptoms of glaucoma.

721. TWEEDY, J. **Dislocation of the eyeball through depressed fracture of the floor of the orbit into maxillary antrum.** *The Lancet*, Aug. 27, 1881, p. 375. A middle-aged farmer fell, and was gored in the left eye by a bull. It was supposed that the eyeball had been gouged out, but on the subsidence of the swelling it was found displaced downward, and fixed against the floor of the orbit; the clear cornea looked upward and forward; fundus illuminated through pupil, but no details visible; eye quite blind; enucleation as a precaution; globe firmly adherent by strong fibrous adhesions to the deeply depressed fracture of the floor of orbit. E. NETTLESHIP.

722. VAN DUYSE. **Coloboma of the eye, and a congenital serous cyst of the orbit.** *Annal. d' Ocul.*, Sept.-Oct., 1881. Duyse reports the following case. Left: strong ectropium of lower lid; coloboma of iris, choroid, and sheath of optic nerve. Right: strong ectropium of lower lid; serous cyst of the orbit, with microphthalmus. As a result of the coloboma of the choroid and optic-nerve sheath, the sclera was probably so ectatic that it formed itself into a sac, which became detached from the globe, forming a cyst. MARCKWORT.

723. ABADIE. **Exophthalmic goitre.** *France Méd.*, No. 12, 1881.

724. TILLAUX. **Exophthalmic goitre.** *France Méd.*, No. 16, 1881.

725. RAMPOLDI. **A singular case of pulsating exophthalmus.** *Ann. di Ottalm.*, vol. x, 2. A woman, 67 years of age, showed a pulsating exophthalmus, which came suddenly without any known cause. Deafness appeared simultaneously. Compression of the common carotid for about a quarter of a minute caused all pulsation to cease, and the globe to return almost entirely to its normal position. DANTONE.

726. SECONDI. **Pulsating exophthalmus.** Clinical history, etc. *Ann. di Ottalm.*, vol. x, 3. Digital compression was not done in the beginning. Later it was resorted to (once as long as 31 hours). The exophthalmus, pulsation, and noises were not reduced thereby, but the general condition very much improved. DANTONE.

727. NIEDEN. **A new case of pulsating exophthalmus, oc. utr.** *Archiv f. Augenh.*, vol. x, p. 641. Double-sided pulsating exophthalmus occurred in a woman after delivery; she had fallen on the back of her head four months and a half before. The patient could not stand compression of both of the carotids at the same time. Compression had a good effect on the left, but none on the right side.

728. ROCKWELL. **A case of exophthalmic goitre; recovery under treatment by electricity.** *N. Y. Med. Journ.*, June, 1881. Rockwell has treated ten cases, and has noticed improvement in six, the last of which he records at length. He places the cathode over the cilio-spinal centre, or over the seventh cervical vertebra, the anode on the auriculo-maxillary fossa, and strokes with the latter pole, along the inner edge of the sterno-cleido-mastoid to its upper end. BURNETT.

729. MARTIN, G. Pulsating exophthalmus, treated by electropuncture. Paris, 1881.
730. ABADIE. On certain forms of goitre with exophthalmus. *L'Union*, No. 157.
731. GAUCHER. On goitre with exophthalmus. *Gaz. des Hôp.*, No. 133.
732. ADAIR. Cases of goitre with exophthalmus. *Phil. Med. and Surg. Rep.*, vol. xlv, 2, p. 89.
733. TAPRET. On exophthalmus with goitre. *Arch. Génér.*, vol. vi, p. 73.
734. WOOD. Exophthalmus with goitre. *Mich. Med. News*, vol. 4. March 5th.
735. STARCKE. Report of a case of morbus Basedowii. *Berl. klin. Wochenschr.*, No. 3, 1881.
736. DESNOS. The treatment of exophthalmic goitre by subcutaneous injections of duboisine. *Bull. Général de Thérap.*, 1881, No. 2. Desnos found an improvement in the symptoms of morbus Basedowii, after injections of duboisine, dose 0.005—0.0001 gram. (i. e. $\frac{1}{100}$ — $\frac{1}{1000}$ grain.)
737. DUJARDIN-BEAUMETZ. On duboisia in the treatment of exophthalmic goitre. *Dublin Journ. of Med. Scienc.*, 1881, p. 81.
738. MARKLEIN. Report of a case of exophthalmic goitre. *France Méd.*
739. NOYES. (*Rep. Amer. Ophth. Soc.*, 1881.) Reports a case of pulsating exophthalmus in a young girl, caused by a fall.
740. HIGGENS, C. Vascular protrusion of the eyeball; ligature of the common carotid. *Trans. Med. and Chir. Soc.*, London, 1881, p. 247.

A woman, 42, with ptosis of left eye from pulsating tumor in orbit, increased by stooping; systolic bruit all over the head; pulsation and bruit stopped by compression of carotid. $V=\frac{1}{2}$; no papillitis, but venous congestion of retina. Symptoms began with deafness and noises in ear six months; then failure of V, and gradual protrusion, at first only when stooping. No history of injury. After two weeks of rest in bed, etc., symptoms worse, and common carotid ligated, April, 1880. Complete cure, permanent to date of printing, August, 1881, sixteen months. Two days after operation right hemiplegia began, lasting with frequent variations for about three weeks, and then completely disappearing. Reference to recent American cases, by Morton, 1876, and Frothingham, 1877.

E. NETTLESHIP.

VI.—CONJUNCTIVA, CORNEA, SCLERA, AND ANTERIOR CHAMBER.

741. F. VON ARLT. A clinical description of the diseases of the eye. First part, conjunctiva, cornea, sclera, iris, and ciliary body. Wien, 1881. W. Braumüller. This monograph is an excellent guide to practitioners of medicine in studying the ordinary eye diseases, dwelling particularly upon the connection of their etiology and pathology, upon which the diagnosis, prognosis, and treatment are based; it is also of importance to sanitary and legal authorities. With these considerations in mind Arlt gives a well-defined description

of the diseases of the conjunctiva, the cornea, the sclera, iris, and ciliary body ; and also their therapeutics.

742. GRÆFE, A. On the **caustic and antiseptic treatment of diseases of the conjunctiva**, with special attention to blennorrhœa neonatorum. R. Volksmann's Sammlung klinischer Vorträge, No. 192, 1881. Græfe discusses the principles of caustic and antiseptic treatment of the above diseases, and strives to give the conditions under which one should be used in preference to the other, and also those in which they should both be employed at the same time. According to G. the antiseptic treatment should be followed where *prophylaxis is of importance*, also in the beginning of contagious diseases and in all cases where the inflammation does not tend toward a simple blennorrhœa, but more toward a *croupous or diphtheritic* character. The caustic depletive treatment is best employed where the use of antiseptics could not prevent the development of great blennorrhœic swelling, or in the later stages of diseases of a croupous or diphtheritic nature. He calls special attention to these rules in the treatment of blennorrhœa neonatorum.

743. SEELEY. The non-astringent and caustic treatment of conjunctival inflammation. *St. Louis Med. & Surg. Jour.*, vol. xl, No. 1, 1881.

744. GALEZOWSKI. The means of diminishing the dangers of ophthalmia neonatorum. *Ann. d' Hygiène publique*, No. 28, 1881.

745. HIRSCHBERG and KRAUSE. On the **pathology of contagious eye diseases**. *Centralbl. f. practk. A.*, 1881, p. 270. H. and K. publish the results of their investigations of the secretions from the eye, viz. : the secretions in gonorrhœic and diphtheritic ophthalmia, the pus from ophthalmia neonatorum, from acute catarrh, croupous, phlyctænular, and simple catarrh of the conjunctiva, from conj. granulosa, from the small abscesses originating in the glands of the lids ; the pathological secretions from the lachrymal canals, abscess of the cornea with hypopyon, and panophthalmitis after cataract extraction.

746. HAAB. The **micrococcus of blennorrhœa neonatorum**. Contribution to ophthalmology on the occasion of the jubilee of Prof. Horner, p. 159. Wiesbaden, 1881. Haab examined 11 cases of blenn. neonatorum, 2 cases of gonorrhœal ophthalmia, and 5 cases of gonorrhœa of the urethra according to Koch's method. The cocci were identical in all. Their number was more or less proportionate to the severity of the disease. They could be found as long as there is secretion. The blenn. neonat. resulted from gonorrhœa in the father and mother. In the first part of the disease disinfection is to be employed ; in the later stages nitrate of silver. Dropping in a 2-per cent. solution of resorcin.

747. BURNHAM. **Carbol. acid in gonorrh. ophoh. ; 3 severe cases treated by frequent and free use of carbolic acid lotion** (1 in 20) applied to everted eyelids, the patient also using it day and night. It gives the patient little discomfort, is markedly astringent as well as antiseptic, and appears to act most beneficially on the cornea, especially in those cases where it threatens to perforate. *R. Lond. Ophth Hosp. Rep.*, vol. x, June 2, 1881.

FITZGERALD.

748. FUCHS. On the treatment of **gonorrhœal conjunctivitis**. *Centralbl. f. practk. A.*, 1881, p. 198. The treatment of this disease is to be

directed to the reduction of the pressure on the eyeball, diminution of the secretion, and the removal of secretion already formed. The first one of these precautions deserves the greatest attention, because it is from it that the cornea runs the greatest danger of suppuration. The pressure is caused by the chemosis of the conjunctiva and the swollen lids, whereby the vessels which supply the margins of the corner are compressed, causing an insufficient circulation. In order to do away with this factor Critchet proposes to divide the upper lid up to the orbit in severe cases, evert the flap, and fix it to the skin above. The cornea does not suppurate when this is done; the lid can be afterward stretched into its proper place, showing but a very slight defect. Fuchs modifies this operation, and divides the outer commissure to such an extent as to relieve also the symptoms of pressure. He puts a suture through the under lid and attaches it on the check, ectropionizing it entirely. He detached it at the end of five days and the healing was good. The advantage lies in a diminution of pressure from the lids, by the complete separation of the softer parts as well as the orbicularis, and the removal of the under lid, a diminished secretion, and extensive bleeding.

749. SPENCER, WATSON W. Acute ophthalmia of both eyes. *Trans. of the Clin. Soc.*, vol. xii, p. 43.

750. BONAGENTE, ROMOLO. Contributions to the study of conjunctivitis. *Giornale internaz. di Science Mediche*, vol. iii, Napoli. B. recommends the continued application of heat in diphtheritic conj., and the cleansing of the conjunctiva with a 3-per-cent. solution of chloral. DANTONE.

751. ADAMS, T. E. Some cases of diphtheretic conjunctivitis. *Ophth. Hosp. Rep.*, vol. x, 2, p. 211. During the last few years A. has observed a number of cases of membranous conjunctivitis in Moorfield's Hospital. The usual treatment is to wash the eye frequently with a solution of quinine. It answered in all milder cases, but he lost two severer ones. FITZGERALD.

752. BOCKMAN. Trachoma. *Norske Mag.*, vol. ii, 3, p. 209. During a visit in Northern Norway, B. observed that trachoma, although frequent in other parts of the country, was much more so among the Finns, who are very dirty, and live in houses always full of smoke. BULL and SCHIÖTZ.

753. PECK. Inoculation of both eyes for complete pannus, with gonorrhœal pus. *N. Y. Med. Rec.*, July 2. A young man, 21 years of age, was suffering from such a trachomatous pannus that he was just able to find his way. He was inoculated several times with gonorrhœic pus. His vision improved so that he could count figures at 9' with his right eye, and at 1½' with his left.

BURNETT.

754. CRITCHETT, G. Peritomy. *Trans. Ophth. Soc., United Kingdom*, vol. i, 9, 1881. C.'s object is to draw attention again to the treatment of trachomatous pannus, thinking that it has fallen somewhat into undeserved disuse. He thinks that peritomy in curing the corneal vascularity acts directly on the lids by removing a source of mechanical and nervous irritation. He finds that the granulations on the lids gradually wither without further treatment when peritomy is performed. A complete zone of conjunctival and subconjunctival tissue, 2½ lines (5 mm.), must be removed quite up to the edge of the cornea. The firm

white line of scar which is necessary for final success takes several months to form, the symptoms being even worse for a short time after the operation.

E. NETTLESHIP.

755. BONNEVILLE. On the treatment of trachoma and its consequences. *Thèse de Paris*.

756. CUIGNET. On simple chronic conjunctivitis. *Rec. d'Ophth.*, vol. iii, No. 9, 1881.

757. MORANO. Pathogenesis of granular conjunctivitis. *Giorn. delle Malatt. degli Occhi*, vol. iv, Gennaio, 1881.

758. LORING. Conjunctivitis from impure dust from the streets. *N. Y. Med. Rec.*, April 9, 1881. L. describes a disease of the conjunctiva which he has treated in New York. It consists of a hyperæmia of the conjunctiva, and is distinguished by its obstinacy. L. attributes it to the dust from the dirty streets. He treats it with weak solutions of silver. BURNETT.

759. KRAMNICK. On the causes of conjunctivitis among soldiers. *Wratsch.* No. 10.

760. BEAUVAIS. On the accidents caused by the administration of eye waters.

761. GALEZOWSKI. Oleum cadinum an excellent antiseptic in ocular disease. *Rec. d'Ophth.*, May, 1881. G. uses oleum cadinum (2 to 10 vaseline) with good results in all cases of purulent eye disease.

762. DOR. Syphilitic papules of the bulbar and palpebral conjunctiva. *4e Rapport de la clinique*, Lyon, 1881.

763. KUBLI. The clinical significance of so-called **amyloid tumors of the conjunctiva**. *A. f. A.*, vol. x, p. 430. Amyloid tumors of the conjunctiva are *sui generis*. They are not the result of trachoma but sometimes occur with it, but accidentally. (Will appear in the next issue of these ARCHIVES.)

764. WALB. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 331. W. describes a spontaneous abscess of the conjunctiva bulbi.

765. HALTENHOFF. Melanotic sarcoma of the conjunctiva. *Rev. Méd. de a Suisse romande.*, vol. i, 3, p. 168.

766. MEYER. Epithelioma of the eyeball. *Gaz. des Hôp.*, No. 32.

767. CEPPI. Primary sarcoma of the conjunctiva. *Progrès Méd.*, vol. ix, No. 22, p. 423.

768. CHISOLM. Round-celled sarcoma growing from the conjunctiva of a little girl five years of age; a rare pathological development. *Virg. Med. Monthly*, May, 1881.

769. WEST. Epithelioma of the conjunctiva bulbi. *Bost. Med. and Surg. Journ.*, July 7, 1881.

770. MANDELSTAMM. Case of combustion with lead; termination good. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 283.

771. SNELL, S. **Nyctalopia with peculiar appearances of the conjunctiva**. *Trans. Ophth. Soc.*, vol. i, p. 207, 1881. The well-known functional night-blindness, often with dry patches on the ocular conjunctiva, occurs sporadically in children in and near Sheffield every spring. S. here records 10

cases and has seen others. The affection sometimes recurs in the same child in successive springs. The conjunctival patches were always present, and disappeared when the night-blindness ceased. No cause was found, and the children were not underfed. Cod-liver oil rapidly cures all the symptoms. The conjunctival patches were examined microscopically. E. NETTLESHIP.

772. GILLES DE GRANDMONT. Phthisis of the cornea and its treatment. *Gaz. d'Ophth.*, May, 1881.

773. BURNHAM. Corneal infiltration with hypopyon. *Roy. London Ophth. Hosp. Rep.*, vol. x, 2, 1881. Three modes of treatment were adopted in these cases: 1. Eserine (grs. ij to $\frac{3}{4}$ j) instilled four or five times daily, frequent bathing with decoction of poppies, leeches to the temple if there was much pain, and two grains of quinine three times daily. 2. Sæmisch's operation added to above. 3. Atropine drops three times daily, frequent bathing with belladonna fomentations, and quinine internally. The second method, combined with eserine, in B.'s opinion, gave the most satisfactory results. When the corneal infiltration and hypopyon were not great, the first mode of treatment was sufficient. In the third method the progress toward recovery was slower. Eserine appeared specially adapted to those cases where there was little, if any, conjunctival injection. B. asks the question whether the beneficial action of eserine may not be partly due to its powerful effect on the accommodation of the eye, calling it into increased activity, and thus bringing about an unusually large vascular supply to parts in close vicinity to the cornea. As a result of its use he speaks of a brighter corneal lustre, and also at times of the presence on the cornea of vessels so minute that they can only be seen by oblique illumination and the use of a second lens as a magnifier.

When there is much photophobia and conjunctival injection atropine often acts better, and also where iritis is present. In a few cases of corneal infiltration with some conjunctivitis the solution of carbolic acid (1 in 20) was used with good effect.

774. GOSSELIN. On chronic keratitis and iritis. *Rev. méd. franç. et étrang.*, 1881, No. 5.

775. BINAC. Contribution to the study of cachectic keratitis. *Thèse de Paris*, 1881.

776. PECHDO. Progressive ulcer of the cornea, and its treatment. *France Méd.*, Nos. 14 and 16, Feb., 1881.

777. WAHLFORS. Corneal ulcer. *Finska lakaresällsk handl.*, vol. xxii, 4, p. 294.

778. SIMI. A case of onyx of the cornea. *Boll. d'Ocul.*, vol. iii, No. 8, April, 1881.

779. CASTALDI. Contribution to the study of the genesis of corneal ulcer. *Napoli*, 1881.

780. SEBADINI. Serpent ulcer of the cornea, and its treatment by antiseptics. *Siècle Méd. du 30 Mai*, 1881.

781. DANESI. Contribution to the treatment of serpent ulcer. *Boll. d'Ocul.*, vol. iii, No. 10.

782. DEL TORO. Cauterization in diseases of the cornea. *Chronic. Oftal.* Cadiz, vol. x, p. 105.

783. RENTON. Treatment of sloughy ulceration of the cornea. *Edin. Med. Journ.*, vol. cccxv, p. 223, Sept., 1881.

784. SIMI. Actual cautery of the cornea. *Boll. d'Ocul.*, vol. iii, No. 11, Luglio, 1881. An ulcer of the cornea of long standing (one month) healed rapidly after cautery with a white hot strabismus hook. DANTONE.

785. HAENSELL, P. Examination of the condition of the substance of the cornea in traumatic keratitis. *Arch. f. Ophthalm.*, vol. xxvii, 2, p. 55.

786. BEAVER. On wounds of the cornea, with remarks on the use of sulphate of atropine and duboisine. *Phil. Med. and Surg. Rep.*, vol. xlv, 6, p. 147, Feb.

787. DÉSALLÉES. On the best mode of treatment of injuries of the cornea from ears of grain. *Rec. d'Ophthalm.*, 1881, No. 7.

788. JANY. Keratitis neuroparalytica. *Centralblatt f. pract. Augenheilk.*, 1881, p. 193. In a healthy man an affection of the cornea happened after an attack of apoplexy, its probable origin being neuroparalytic. Improvement after the use of an induced current of electricity.

789. RAMPOLDI. Della keratite dei mietitori et dei suoi rapporti colla dacryocistite. *Annal. di Ottalm.*, vol. x, fasc. 4 and 5, 1881. Among 25 cases of hypopyon keratitis in maize harvesters during the summer months, 15 had dacryocystitis. The latter appeared either before or during the attack of keratitis. DANTONE.

790. SIMI. Dacryocystitis with hypopyon. *Boll. d'Ocul.*, Firenze, vol. iii, 2.

791. HOCQUARD. Epithelial patches on the cornea. *Arch. d'Ophthalm.*, vol. i, p. 481. H. describes an elevated white plaque, with irregular but well defined edges, on a corneal opacity near the line of the closure of the lids. There was but little irritation present. It looked like flour, or a thin layer of white soapsuds. Particles could be scraped off, and were found to consist of epithelial cells and fat-globules. It consisted in a hyperplasia and fatty degeneration of the corneal epithelium. (Ribbon-shaped keratitis.—K.)

V. MITTELSTÄDT.

792. SCHIESS-GEMUSEUS. Persistent formation of blisters on the cornea after inflammation of the other eye. *Klin. Monatsbl. f. Augenheilk.*, vol. xix, p. 386. Prolapse of iris occurred after cataract extraction in the right eye, producing inflammation, and causing the appearance of silvery blisters in the epithelium of the left. They had transparent contents. The left eye showed the remains of a traumatic cataract. The process disappeared after the application of a compressive bandage.

793. ALEXANDER. Keratitis bullosa. *Deutsche med. Wochenschr.*, 1881, No. 41. A. describes a case of keratitis bullosa in an eye, which presented symptoms of chronic glaucoma. The cornea showed parenchymatous inflammation with striped opacities.

794. ARMAIGNAC. Contributions to the study of punctate keratitis. *Rev. d'Oculist. du Sud-ouest*, 1881, No. 4, p. 73.

795. BERGMEISTER, I. **Buphthalmus congenitus.** *Mittheil. des Wiener med. Doctoren-coll.*, vol. vii, No. 15. B. describes two cases of congenital buphthalmus. One of them seemed to show that congenital buphthalmus is caused by an inflammatory process in the shape of a choroiditis and serous cyclitis.

796. GALEZOWSKI. **The treatment of interstitial keratitis and sclero-keratitis by iridectomy.** *Rec. d' Ophth.*, July, 1881. He thinks that iridectomy is the most rapid and safest means of treatment in those cases of interstitial keratitis, where the disease takes an irregular course, and induces complications of the cornea, iris, or sclera. The operation must be made as soon as possible after we are satisfied that there is no improvement from external and internal treatment. It also gives satisfactory results in sclero-keratitis and in scleritis.

797. RAMPOLDI. **A singular pathological phenomenon of circulation in the cornea.** *Ann. d'Ottalm.*, vol. x, 1. R. observed a young girl, in whom the lower part of the cornea of the left eye became opaque when she held down her head for fifteen minutes. When she held it up again the opacity disappeared in about six minutes. This remarkable phenomenon was observed for about one month, but disappeared on treatment with tonics. The first examination showed a slight protrusion of the eye, but this disappeared also under the treatment.

DANTONE.

798. NUEL. **Dilatation of the pericorneal lymphatics and vascular papillæ on the cornea.** *Arch. d' Ophth.*, vol. i, p. 449. He examined the cornea and surrounding conjunctiva of the eye. It had been enucleated on account of glioma. Before the perforation of the glioma the eye showed glaucomatous symptoms, and also great swelling of circumcorneal conjunctiva. The microscope showed the latter to have been caused by extensive dilatation of the circumcorneal lymph spaces, containing a serous fluid. Nothing else was found in them. The cornea was much thickened by a serous infiltration of its tissue. There was a vascularization of its deeper layers, and many vascular papillæ were found beneath the epithelium. These pericorneal lymphatics play a certain part in the nourishment of the cornea, and in the diseases which occur in this locality, as in acute glaucoma. The chemosis and clouding of the cornea indicated that there had been a choking up of the canals. V. MITTELSTÄDT.

799. MINOR, JAMES J. **Anæsthesia of the cornea, and its significance in certain forms of eye disease.** *Amer. Jour. Med. Sc.*, July, 1881.

800. DAMALIX. **On the treatment of chronic diseases of the cornea by massage.** *Arch. d' Ophth.*, Sept.-Oct., 1881. He reports seven cases in which massage had been done according to Pagenstecher's method, and arrives at the conclusions: that massage is easy to perform, works rapidly, and is painless. In the treatment of chronic diseases of the cornea in young people, it serves a good purpose if we use yellow ointment and general treatment at the same time.

MARCKWORT.

801. MORANO. **Contribution to the study of staphylomata.** *Giorn. delle mal. degli occhi*, vol. iv, Gennaio, 1881. He recommends a long treatment with eserine, before abscission of staphylomata. He thinks it has a great influence on the formation of a smooth scar.

DANTONE.

802. DOR. The treatment of keratoconus by the application of cylindrical glasses. *Le Lyon Méd.*, Feb. 20, 1881.

803. BENAKY. Keratoconus and its treatment by cylindrical glasses. *Thèse de Lyon*, 1881.

804. v. REUSS. Keratitis. *Eulenberg's Real-Encyclop.*, vol. vii, p. 343.

805. v. REUSS. Keratocele. Same, page 356.

806. v. REUSS. Keratomalacia. Same, page 358.

807. v. REUSS. Keratoplasty. Same, page 358.

808. OPPENHEIMER. Deep lacerated wound of the eyeball. Scleral sutures. *N. Y. Med. Rec.*, vol. xix, 1.

809. FRIDENBERG. Penetrating wound of the sclera. Suture. Recovery with nearly perfect vision. *N. Y. Med. Rec.*, Nov. 12, 1881. The wound was closed by conjunctival sutures. The case was treated antiseptically. At the discussion of the paper at the Society of German Physicians, Dr. Welt mentioned a similar case, where an equally good result was obtained, yet no special antiseptic means were employed. [Many such cases are on record.—K.]

810. PARDO, E. A large scrofulous ulcer of the sclera in a child seven years of age. *Riv. Clin.*, 2 s., vol. x, 11, p. 338.

811. PRIVÉ. Rheumatic scleritis. *Thèse de Paris*, 1881.

812. STORY. Staphyloma of the sclera. *Dublin Journ.*, vol. lxxi, p. 180. February, 1881.

813. ROTHHOIZ. On the etiology of posterior staphyloma of the sclera. *Arch. f. Ophth.*, vol. xxvii, 2, p. 25. He thinks that the funiculus scleroticæ of Hannover plays a great part in the formation of staphyloma posticum.

814. LIPPINCOTT. **Foreign bodies in the anterior chamber.** *Pittsburgh Med. Journ.*, August, 1881. Case I.—A fragment of steel, one third of an inch in length, was attached by one end to Descemet's membrane, while the other projected into the anterior chamber. Unsuccessful attempts at its removal were made with Grüning's magnet. It was removed by means of a pair of fine forceps. Case II.—A piece of copper, one quarter inch in length, had one end embedded in the lens, the other free in the anterior chamber. This was likewise removed by means of fine forceps, through an upward linear incision. BURNETT.

C.—IRIS AND UVEAL TRACT, GLAUCOMA, SYMPATHETIC OPHTHALMIA, REFRACTIVE MEDIA (LENS AND VITREOUS BODY), RETINAL AND FUNCTIONAL DISTURBANCES, OPTIC NERVE, INJURIES, FOREIGN BODIES (PARASITES), OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

COMPILED BY DR. A. NIEDEN.

Translated by Dr. F. D'OENCH, New York.

I.—IRIS AND UVEAL TRACT.

815. ADAMS. On some **unusual forms of iritis.** *Roy. Lond. Oph. Hosp.*

Rep., vol. 10, pt. ii, p. 214, June, 1881. Three years ago A. reported to the Hunterian Society three cases of iritis occurring in young girls about the age of puberty, in whom he was utterly unable to find any dyscrasia to account for the occurrence. Attack characterized by an abundant effusion of lymph, producing firm posterior synechiæ, total absence of pain or photophobia, great injection, not limited to or visibly intensified at the ciliary region; disease subsides apparently of its own accord, leaving the eye scarcely at all impaired. All the cases were unilateral and on the left side. Recently met a precisely similar case where there were decayed teeth in upper jaw on same side, but in the other the teeth were good.

Another case A. reports is that of a gentleman, æt. 29, free from gout, rheumatism, or syphilis, but living in a marshy country, and subject to intermittent fever. Left eye, marked circumcorneal injection; pupil, clear and active; V — $\frac{3}{8}$. Spots of uveal pigment on right capsule. In a few days, under atropine, a few posterior synechiæ were seen in left eye. Ordered atropine and iodide of potassium. A week later was worse. Suffered great pain, which was worse at two o'clock in morning. Periodicity so marked that miasmatic influence suggested itself to A., who prescribed quinine, which was followed by immediate relief. Had slight relapses since (now four years), which were always cut short by quinine. FITZGERALD.

816. ARLT. Diseases of the iris and the uveal tract in his clinical descriptions of the diseases of the eye. Vienna, 1881, vol. iv. Arlt pleads for a classification of the various forms of iritis according to their etiology and not the nature of the exudations produced. The granuloma of the iris he assigns to the tuberculous form. In sympathetic ophthalmia the author is inclined to accept transmission through the ciliary nerves.

817. ARMAIGNAC. Aniridie congénitale presque complète. *Rev. cliniq. d'oculist.*, 1881, No. 10, p. 219.

818. BROWN. Case of congenital aniridia with cataract. *The American Specialist*, Nov. 1, 1881. There was also nystagmus. Cataract developed at the age of 26. Four years later extraction, the result of which was: Left, V — $\frac{1}{8}$; and Right, good perception of light and ability to recognize the outlines of objects. SWAN BURNETT.

819. DEHENNE. Ossification de la choroïde. *Soc. de méd. pratique*, April 17, 1881.

820. FUCHS. The sarcoma of the uveal tract. W. Braumüller, Vienna, 1882, 295 pages and 6 lithog. plates. Compilation of 16 cases of sarcoma of the iris, 22 of the ciliary body, and 221 of the choroid: among these, 22 of his own observation: 30 were leuco- and 229 melano-sarcomata; the former were mainly confined to the anterior and middle parts of the globe, the latter to the posterior part. For the interesting details in regard to the average time necessary for the development, relapses and metastases, the age of the patients, location, pathogenesis, etiology, and prognosis, see the work itself.

821. HIRSCHBERG. Coloboma and microphthalmus. *C. f. A.*, vol. v, p. 265. Microscopic description of an amaurotic globe. The staphylomatous bulging of the lower part of the sclera, the partial atrophy of the choroid at

this spot, and the total, funnel-shaped detachment of the retina, with a partial defect in the lower wall corresponding to the coloboma, are of especial interest. Bone had formed in a cyclitic exudation.

822. HORTSMANN. **Recurrent iritis.** *Transact. of the Heidelberg Oph. Congr.*, Sept., 1881. Hortsmann reports 49 cases in 34 individuals. In 38 posterior synechiæ remained behind. Sometimes these are the cause of a relapse; more frequently they are due to syphilis, gonorrhœa, and scrofulosis, so that general treatment, combined with the use of salicylate of soda, often produces excellent results.

823. HULKE, J. W., and Dr. GOWERS. **Ophthalmoplegia interna.** *Trans. Ophth. Soc. Un. Kingd.*, i, 155, 1881.

H. believes it probable that the triple group of symptoms—paralysis of ciliary muscle, of sphincter, and of dilator pupillæ—named by Hutchinson *ophthalmoplegia interna*, is caused by disease of intra-ocular ganglia, not to disease of lenticular ganglion. After excision of the lenticular ganglion, the pupil, though of medium size and motionless to light, dilated under electrical stimulation of the cervical sympathetic and to atropine (Adamük, Hensen, and Völckers), and hence must receive motor fibres independently of the ganglion.

Mr. Hutchinson replied that this condition was just what he had described, so far as atropine and light were concerned, but that galvanism had not been tried in his cases. He thought it probable that both lenticular and intra-ocular ganglia were sometimes diseased; he was, however, in some doubt whether the disease might not after all be central.

E. NETTLESHIP.

824. JANY. **A case of sarcoma of the uvea.** Paper read at the meeting of physicians of the Kalisch. Gubern., Nov. 17, 1880. *Medycyne*, T. ix, July, 1881. In a woman 24 years old, and in the 6th month of pregnancy, an alveolar round-cell sarcoma of the ciliary body had penetrated the iris and sclera, had involved the choroid, and produced a partial detachment of the retina.

825. KIPP. **Sarcoma of the choroid.** *Rep. of the Amer. Ophth. Soc.*, July, 1881. Two cases. The first was that of a healthy woman, 44 years old, who three to four months ago noticed that her sight began to fail. The neoplasm occupied the temporal half of the posterior part of the globe, and had not caused an increase of tension. The same condition prevailed in the second case, a woman 46 years old, who suffered from a melanosarcoma.

SW. BURNETT.

826. MANDELSTAMM. **Case of sarcoma of the choroid.** *St. Petersb. Med. Wochenschr.*, 1881, No. 17. A child. Half a year after enucleation, metastases in the liver; about six months later, death.

827. MASSE. 1. Des tumeurs de l'iris. 2. De la formation des kystes et des tumeurs perlées de l'iris. Pag. 21, resp. 13. Bordeaux, 1881. Bellier.

828. MICHEL. **Iris and iritis.** *G. A. f. Ophth.*, vol. xxvii, 2, pp. 171-282; *cfr.*, *Heidelb. Ophth. Vers.*, Sept., 1881; *Sitzungsber.* A pathological and clinical investigation upon which Michel proposes to base a new classification; not one upon the manner in which the pathological process manifests itself, or upon its intensity, or upon certain stages of it; but upon the affection: 1. Of the vascular system. 2. Of the lymphoid apparatus. 3. Inflammations. 4. Retrograde changes. 5. Neoplasms. 6. Changes of position.

7. Functional disturbances. 8. Foreign bodies and injuries. 9. Congenital anomalies. For details see the article itself.

829. NETTLESHIP, E., and FOX, L. WEBSTER. **Multiple growths on iris and ciliary body after iritis.** *Trans. Oph. Soc. United Kingdom*, i, 19, 1881. (With plate.)

A delicate, undergrown girl, 13, had double iritis with keratitis punctata, and a large nodule like a gumma on one iris; disease of vitreous and diffuse retinitis in both; no choroiditis. No evidence of syphilis, acquired or inherited, nor of any constitutional disease; blood normal. Under mercurialization the nodule enlarged, and new ones appeared; the disease was thought probably tubercular, and an unfavorable prognosis given. Two months after admission part of the largest growth was excised; no severe reaction; wound became filled by the growth. Similar growths had now begun in the other (right) eye. At end of three months, the left eye seemed hopeless, and to be keeping up irritation in the right, and was excised. The growths continued to increase in the second (right) eye for another six months, when they rather rapidly diminished and disappeared, with great improvement of V. Neither mercury nor iodide of potassium after the first two months. The growths in the enucleated eye showed the typical structure of gummata. E. NETTLESHIP.

830. NITOT. **Des gommes syphilitiques de l'iris et du corps ciliaire.** P. 144. Paris, 1881. Baillière.

831. SCHIESS-GEMUSEUS. **Melanosarcoma chorioideæ.** *Jahresb. der Augenheilkunst. z. Basel f.* 1880. A small tumor had perforated the globe, thus becoming an extra-ocular one, but showed no growth within the eye.

832. SNELL, S. **Case of cyst (cholesteatomatous) of the iris.** (*Roy. Lon. Oph. Hosp. Rep.*, vol. x, pt. 2, p. 208, June, 1881.) The result of punctured wound caused by a chip of metal. Cyst about the size of a pea, but more oval in form. Lens opaque. Cyst removed with the piece of iris to which it was attached, by simultaneously introducing two broad needles, bent at an angle, on each side of the tumor. When these were withdrawn, a Weber's canaliculus knife was passed into the opening, gently insinuated between the cyst and the cornea, and brought out again through the other incision. The intervening bridge of cornea was then cut across by it, and the piece of iris with the cyst was excised. The latter was removed entire. Microscopical examination showed contents consisted of a number of very large, clear, closely packed cells like fat-cells, in which no nucleus was discernible; great number of cholesteroline crystals; large quantity of fatty matter, pigment cells, and granules; sparsely scattered tessellated epithelium, and homogeneous, purely granular material. The delicate anterior wall consisted of homogeneous material, pervaded by very fine, moderately well-defined fibres. The membranous-looking portion attached to the iris was associated with fatty materials and *débris*, and the fibres were large and more sharply defined than those of the anterior wall.

S. remarks that the great majority of these cases are associated with injury, and he lays stress on the importance of removal of the entire cyst, if practicable. He advocates the mode of operating adopted in this case for growths in the anterior chamber encroaching on the inner corneal surface. FITZGERALD.

833. TARTUFERI. Un caso di granuloma dell' iride senza cellule giganti. *Ann. di Ottal.*, vol. x, p. 521.

834. VELARDI, E. Studio sulla coroidite sifilitica. *Giorn. internaz. delle scienz. med.*, 1881, vol. iii. Velardi considers disseminate choroiditis to be the result of a proliferation of cells similar to that of the gumma of the iris. The diagnosis of syphilis, however, cannot be made from this form of inflammation of the choroid, unless there are other symptoms of syphilis besides.

835. WEBSTER. Two cases of bony formation in the eye. *Med. Gazette*, April 2, 1882. In one an exudation into the ciliary body, in the other an ossification of the choroid had taken place. In one case the lens had become calcified. SWAN BURNETT.

836. WIDDER. Syphilitic iritis and its relations to the syphilitic diathesis. *G. A. f. Ophth.*, vol. xxvii, 2, pp. 99-170. The author begins with the history and course of syphilis in general. The specific affections of the eye are local manifestations of the constitutional syphilis; iritis is very common in the second stage, occurs in the early phase of syphilis, and is a product of the condylomatous stage. Gummous iritis occurs in 19 per cent. of all cases of syphilis, and mostly at the same time as other secondary symptoms, belongs also to the condylomatous stage, in fact is nothing more than an aggravation of ordinary specific iritis. The nodular product is not a gumma, but a papule. The true gumma of the iris appears only in the tertiary stage. A table of 61 cases is added.

837. WORDSWORTH, J. C. Peculiar granular bodies on iris after discission. *Trans. Ophth. Society of United Kingdom*, i, 23, 1881.

A boy, æt. 7, underwent discission for lamellar cataracts, and three months later for opaque membrane. Three and a half years later a large number of "small globular, pearl-like bodies" were attached by narrow pedicles to the iris or false membrane, and others were loose in the anterior chamber.

NETTLESHIP.

II.—GLAUCOMA.

838. ANGELUCCI. The structure of Descemet's membrane and the development of Schlemm's and Fontana's canals in connection with the etiology of glaucoma. *Transact. of the Med. Internat. Congr.*, London, Aug., 1881. Descemet's membrane is a product of the endothelium of the cornea, and does not participate in the formation of Fontana's canal, which is formed by aqueous humor penetrating between the component parts of the iris, choroid, and ciliary body. No lymph filters through the canal, so that its obstruction has no essential influence on the development of glaucoma. The disease is due to a sclerosis of all the membranes of the eye, and especially of the walls of the blood-vessels. The veins are dilated and in a state of chronic inflammation. Thus the lymphatic spaces are compressed, preventing the efflux of the aqueous humor.

839. BRAILEY, W. A. On the relation of tumors of the eye to intra-ocular tension. (*Roy. Lond. Ophth. Hosp. Rep.*, vol. x, pt. 2, p. 275, June, 1881.) From the evidence furnished in the preceding report B. deduces the following:

"1. That with intra-ocular tumors a stage of very slightly diminished tension precedes the glaucoma ; this last being ultimately, in its turn, followed by a very considerable softening of the eye.

"2. That in cases of tumor implicating solely the exterior of the eye, or even the optic-nerve sheath alone, glaucoma may be developed as a consequence, though there is no preliminary stage of slightly diminished tension.

"3. That the pathological changes accompanying increased tension, whether from intra- or extra-ocular tumors, are those typical of true primary glaucoma.

"4. That in every case of tumor, whether intra-ocular of the retina or choroid, or extra-ocular of the conjunctiva, subconjunctival tissue, optic nerve, or orbital walls, with normal or even slightly diminished tension, these changes can be observed in process of development.

"5. That the course of the pathological changes in a glaucoma may be inferred by a comparison of those observed in cases of tumors in the different stages of tension above referred to."

In connection with the remarks which B. appends to the several propositions he says certain questions suggest themselves.

a. How does the pressure of a tumor produce inflammation, especially that of the ciliary body and optic nerve?

He concludes that these inflammatory conditions are not due to commencing tumor extension, but rather to its physical influence.

b. Supposing that a tumor can influence the tissues immediately in relation with it, how is it that the inflammation travels to more distant parts?

Microscopical examinations show clearly that neither the vitreous body nor the retina is the carrier of inflammation, but the fibrous and vascular tissues of the eye.

c. How do the inflammatory and vascular changes stand in relation to the tension?

It is necessary to suppose that a hypersecretion, due to the inflammation of the ciliary body, can produce the tension, though in the earlier stages this may be below the normal.

d. Are there any other physical causes in action to which we are to attribute the increase of tension?

The application of the peripheral part of the iris to the cornea, a strong factor in preventing the escape of fluids from the eye.

e. What is the cause of this advance of the peripheral part of the iris?

In choroidal tumors this may partly be due to the enlargement of the ciliary folds, and then once this occurs it has been made complete and permanent by means of the fluid, whose exit from the eye has been obstructed in its course to Schlemm's canal.

FITZGERALD.

840. BRAILEY, W. A. On the nature and course of the glaucomatous process. (*Roy. Lond. Ophth. Hosp. Rep.*, vol. x, pt. 2, p. 251, June, 1881.) B. considers that we are now in a position to speak with some precision of this disease. Inflammation of the ciliary body, iris, and optic nerve is always present ; it is one of the earliest symptoms of primary glaucoma, being developed previous to the increased tension. Iris periphery is nearly always applied to cornea. Arteries of ciliary body become dilated, ciliary body alters

in shape, and muscle fibres undergo atrophy, with very commonly dense connective-tissue formation between and in the optic nerve. Choroid is compressed and atrophic. Lens has not exceeded normal diameters in any of the specimens examined, but is flattened antero-posteriorly. Posterior chamber of aqueous usually of great depth. Causes of increase in intra-ocular fluid: hypersecretion from ciliary body, obstructed outflow of fluid by change at periphery of iris; later on the ciliary body and iris have become atrophic, and the occlusion of the entrance to Schlemm's canal remains as the sole agent in keeping up the tension. Iridectomy cures by removing periphery of iris, but when this is atrophied and firmly adherent to cornea its removal cannot be effected. Then sclerotomy may cure by making a new access to Schlemm's canal.

FITZGERALD.

841. BRAILEY, W. A. Two cases of **glaucoma of extremely short duration**. *Ophth. Hosp. Rep.*, vol. x, p. 225.

Case I.—A young man, æt. 37, received an injury from a fragment of metal penetrating the cornea and wounding the lens. Three days later applied at the hospital; T was increased, and there was little or no anterior chamber. In three days more there was severe pain with T 3; the eye was then excised, but no foreign body was found. The eye generally was healthy, though the lens was opaque.

Case II.—A man, æt. 44. The sight of left eye failing for a year. Retina detached at lower and outer part; T diminished. Ten days before eye was excised, after a violent attack of pain, found he could not see light. Three days later eye was tender; T normal, but no perception of light; following day great pain with increased tension. Iridectomy performed three days later. Recurrence of great pain and increased T; eye excised. Tumor found springing from lower and outer part of choroid; its cells spindle-shaped, and its vessels numerous and large. Iris and ciliary body at parts removed from the operation considerably inflamed, but not atrophied. Periphery of iris applied to the cornea, and anterior ends of the enlarged ciliary folds are in contact with it in places. Arteries of ciliary body enlarged. Ligamentum pectinatum is inflamed.

FITZGERALD.

842. FUCHS. **Changes in the cornea due to increased intraocular pressure**. These ARCH., vol. x, p. 460; *Ber. d. Heidelb. Ophth. Vers.*, Sept., 1881. Glaucoma gives rise to an œdema of the cornea, which extends into the larger fissures of the superficial lamellæ of the cornea, as well as into the deeper layers of the epithelium. The characteristic punctate appearance of the cornea is due to this dropsical swelling of the epithelium. The anæsthesia arises from the compression and rupture of the nerves of the cornea.

843. INTERIANO. **Du glaucoma hémorrhagique**. *Rec. a' Ophth.*, Aug., 1881. Interiano distinguishes between: (1) Primary hemorrhagic glaucoma; (2) secondary hemorrhagic glaucoma; (3) glaucoma with hemorrhage. Three stages may be observed in the first: (1) That of the hemorrhage; (2) that of the interval; (3) that of the fully developed glaucoma. The presence or lack of a defect in the field of vision is not of so great importance for the differential diagnosis between ordinary and hemorrhagic glaucoma as some authors would assign to it, as the field of vision is also limited in hemorrhagic glaucoma. In secondary

hemorrhagic glaucoma the hemorrhages occur after the development of glaucoma. He favors sclerotomy, and when it proves useless, enucleation.

MARCKWORT.

844. LITTLE, W. S. **Some cases of glaucoma.** Amer. Ophth. Soc. at Newport, 1881. Four cases, all bilateral, and all in patients under 20, 3 of them in one family. The eyes were hyperopic. In one case glaucoma fulminans set in 12 hours after the instillation of atropine, and a few days later the other eye was also attacked. Three of these patients were also troubled with hemorrhoidal veins, which leads the author to assume a connection between these two diseases.

SWAN BURNETT.

845. LANDESBURG, M. **Case of acute glaucoma in a child of 8 years cured by sclerotomy**, with an additional account of nine sclerotomies performed on glaucoma in adults. *Med. & Surg. Rep.*, Feb. 26, 1881. Sclerotomy can replace iridectomy in absolute glaucoma, in secondary glaucoma, and in those cases of glaucoma where iridectomy has already been performed but failed.

SWAN BURNETT.

846. MARTIN, G. **Du traitement préventif du glaucome dans les cas où déjà un œil se trouve atteint de cette maladie.** Paris, 1881. Delahaye and Comp.

847. MAUTHNER, L. **Glaucoma.** J. F. Bergmann, Wiesbaden, 1881, 116 pages. A monograph as thorough, precise, and elegant as the previous discourses on ophthalmological themes; part second will treat of secondary glaucoma and of the theories of the disease.

848. MINOR, JAMES. **A review of three anomalous cases of glaucoma.** *N. Y. Med. Jour.*, 1881. In the first case in which there was a circumscribed corneal ulcer, glaucoma set in after the instillation of atropine. In the second, the lens had been dislocated into the anterior chamber; the attack yielded to eserine. In the third, a cystoid scar had remained behind after a cataract extraction according to Graefe, in consequence of which the intra-ocular pressure increased; cured by iridectomy.

849. PRIESTLY SMITH. **The pathogenesis of glaucoma.** Report of the Lond. Intern. Med. Congr., Aug. 1881. These ARCHIVES, x, p. 341.

850. QUAGLINO. **Casuistica clinica. Contributio alla storia clinica del glaucòma.** *Ann. d' Ottalm.*, vol. x, Fasc. 1. Quaglino first discusses the occurrence of glaucoma in two widely different conditions of the eye, microphthalmus and buphthalmus, and then relates the clinical history of 4 rare cases: 1. Microphthalmus (about $\frac{1}{2}$ of the normal size) with chronic glaucoma in a young man of 17. Eserine and sclerotomy did not improve the sight, but for the next few months it did not deteriorate. 2. Microphthalmus (about $\frac{1}{2}$ the normal size) with aniridia and absolute glaucoma in the right eye, chronic glaucoma in the left eye of a man 23 years old, who had been amblyopic since birth; in both eyes glaucoma developed about a year ago. Sclerotomy right, iridectomy left, which prevented a further contraction of the field of vision. 3. Synchysis scintillans and chronic glaucoma in both eyes of a man 70 years old. Iridectomy in the right eye cut short the disease. 4. Glaucoma and high degree of myopia in a young student; M — $\frac{1}{4}$. At the same time subacute glaucoma developed. A day after an upward iridectomy had been performed, spontaneous dislocation of both lenses into the anterior chamber. A second

iridectomy downward did not alter the position of the (transparent) lenses and did not entirely dispel the irritation. DANTONE.

851. WEBER, A. **The nature and causes of glaucoma.** Report of the Lond. Intern. Med. Congr., Aug., 1881. These ARCHIVES, x, p. 340.

852. FOX, L. WEBSTER and BRAILEY, W. A. **A case of glaucoma preceded by optic neuritis, with remarks.** *Roy. Lond. Ophth. Hosp. Rep.*, vol. x, pt. 2, p. 205, June, 1881. An intense and rapidly ushered in case of optic neuritis, followed some time later by well-marked glaucoma. This was relieved for a short time by eserine and subsequently by sclerotomy, but the tension again rising to T₃ and the pain being very severe, the eye was enucleated. Microscopical examination showed intense neuritis and thrombus of an anterior ciliary vein. As regards the question, did the disease start as inflammation or as a thrombus? the authors are of opinion that "a neuritis caused an acute inflammation of the walls of the central vessels with a resulting thrombosis of the vein. The inflammation then extended forward, especially along the loose episcleral tissue and its blood-vessels, where it found increased expression in the walls of its numerous veins. Passing inward along the anterior ciliary veins it set up acute inflammation in the fibres of the ciliary muscle." FITZGERALD.

853. WEBSTER, DAVID. **A somewhat remarkable case of glaucoma.** Aphasia. *Arch. of Med.*, New York, Aug., 1881. The connection between the cerebral disease (softening) and the glaucoma is not quite clear. As syphilis existed it might be considered the cause of both. The most important point of the clinical history is the fact that prodromal symptoms of glaucoma had been observed in the right eye for years, without any marked effect on the sight or field of vision. The left eye had already become amaurotic through absolute glaucoma. SWAN BURNETT.

III.—SYMPATHETIC OPHTHALMIA.

854. BECKER, O. **The origin of sympathetic ophthalmia.** *Arch. f. Psych.*, vol. xii, 1. The right eye of a man 19 years old was severely injured by a cut with a whip. Three days later panophthalmitis set in, on the eighth day trismus, and on the fourteenth death ensued. In the left eye there was paralysis of the oculomotor nerve except the sphincter; the eye was totally immovable. The ophthalmoscope showed swelling of the disc, enlargement of the veins, and dulness of the retina. The infiltration of the optic nerve of the injured eye ceased this side of the optic foramen, as also that of the sheath from the pia mater. The intracranial part and the chiasma were not inflamed. The left eye showed only cellular infiltration of the optic nerve and its sheaths from the pia and arachnoid. The thickness of the choroid in the nasal half of the sympathetic eye was increased threefold and the infiltration considerable. There was therefore local choroiditis with secondary retinitis, so that the transmission can only be explained as having taken place through the vascular centres.

855. BRAILEY. **The pathogenesis of sympathetic ophthalmia.** Rep. of the Intern. Med. Congr., London, Aug. 1881. These ARCHIVES, x, p. 336, and *Berlin. klin. Wochenschr.*, No. 40, 1881.

856. CRITCHETT, G. **On the treatment of sympathetic ophthalmia.**

(*Royal London Ophthalmic Hospital Reports*, vol. x, pt. 2, p. 141, June, 1881.)

The following points are considered. Nature and extent of injury giving rise to sympathetic ophthalmia. Period at which the disease usually exhibits itself. Structures it involves, and, finally, the best method of treatment. A foreign body in the eye is a frequent factor, and wounds of the ciliary region are most dangerous. Yet injuries and simple incisions of the cornea have produced it. C. ventures to express his individual opinion that though the nature of the injury exerts a powerful influence, yet the extreme rarity with which operations give rise to it proves that a peculiar and exceptional condition of the nervous system is a potent agent in these cases. He has found that the period occupied in the development of the disease is from 12 to 18 months, and that the eye may remain unchanged for an indefinite period. He insists on "a practical point" which is sometimes overlooked, viz., that though the iris, lens, and capsule are converted into a tough, opaque, and inelastic tissue, yet, as a rule, the fundus is but slightly involved.

As regards treatment during the progress of the disease C. has never been able to satisfy his mind that local or constitutional remedies exert a specifically beneficial influence. There should be no operative interference during the progress of the disease, and it is only when it has quite run its course, and all vascularity of the globe, and sensitiveness to light have disappeared, and this condition has existed for some time, that the plan of treatment proposed is to be undertaken.

The method C. advocates consists in introducing two needles into the anterior chamber and tearing an opening through the thickened capsule. This is to be repeated at considerable intervals of time until the lens is absorbed, and a sufficient opening obtained. He records two cases in which this plan of treatment was successfully adopted.

FITZGERALD.

857. MACGILLAVRY. **Remarks on the origin of sympathetic ophthalmia.** *Nederlandsch. Tijdschrift voor Geneeskunde*, 1881. In connection with a communication of Becker on "the origin of sympathetic ophthalmia" (*Arch. Psych.*, vol. xii, 1), MacGillavry lays stress upon his view being essentially different from that of Knies. While the latter considers the transmission of an inflammation through the intervaginal space of one optic nerve to the other probable, MacGillavry found, when examining a case of sympathetic ophthalmia, that there was not a trace of inflammation in the optic nerve or its sheaths; masses of leucocytes had here and there obstructed the subdural lymphatic space of the optic nerve. MacGillavry therefore suggested that such obstructions in the lymphatic sheaths of the chiasma might be the cause of sympathetic ophthalmia.

C. S.

858. KNIES, M. (Zürich). **Sympathetic ophthalmia.** Contributions to ophthalmology (Horner's jubilee). J. F. Bergmann, Wiesbaden, 1881. A critical investigation, discussing: 1, the nature of the inflammation of one eye; 2, the kind of sympathetic affection of the other eye as plastic uveitis; 3, the time of transmission, at the minimum, 3 weeks. The author accepts transmission along the optic nerve and its sheath from the pia mater by way of the chiasma, even though the nerve no longer transmits light. The therapeutic indications then follow with an abstract of the 16 cases of cures reported.

859. KRAUSE, F. (Hirschberg's clinic). Contributions to the pathology

of sympathetic ophthalmia. *A. f. A.*, vol. x, p. 629. In one case there was interstitial neuritis of the ciliary nerves, clearly marked by the collection of round cells in the interstitial tissue. The nerve-fibres were nowhere destroyed, and the writer supposes that through them the inflammation was transmitted to the other eye, while the optic nerve and its sheaths remained normal.

860. MOOREN. The pathogeny of sympathetic impairment of vision. *Z. M. f. klin. Augenh.*, vol. xix, p. 313. The author is in favor of transmission through the optic nerve. A simple inflammation of the stump of an optic nerve of an enucleated eye is sufficient to transmit it along the nerve, no matter whether the irritation is due to the operation, an impregnation with septic substances, or to fresh products of disease. Primary cyclitis may give rise to sympathetic neurosis in the other eye, and ciliary neuritis in the orbital branches of the fifth nerve may produce plastic cyclitis in the other eye. The kind of primary affection scarcely ever influences the form of sympathetic ophthalmia. Sympathetic ophthalmia may set in in the other eye a few days after an injury, when it chances to affect an eye prepared, as it were, for it by a previous uveal disease. In five cases, in which there were cerebral sympathetic disturbances, which were more accurately characterized by the statements of the patients, and attributable to a painful stump of the optic nerve, the author assumes vaso-motor disturbances as the cause, and thus refers to the well-known experiments of Rumpf-Mooren of transfert, when one eye is irritated mechanically or chemically.

861. NICOLINI. Di una enervazione ottico-ciliare. *Ann. d' Ottalm.*, vol. x, Fasc. 4 and 5. Successful neurotomy in an eye, which had become blind through an injury. After a few hours already the photophobia of the other eye ceased.

862. PECK, E. Sympathetic ophthalmia due to symblepharon. *N. Y. Med. Rec.*, Apr. 16, 1881. Symblepharon of an eye affected with iridochoroiditis; sympathetic ophthalmia in the other. The condition was improved by severing the symblepharon. SWAN BURNETT.

863. PONCET. The development of sympathetic ophthalmia, after enervation. Rep. of the Intern. Med. Cong., London, August, 1881. These ARCHIVES, x, p. 336.

864. SNELLEN. The nature of sympathetic ophthalmia, especially its manner of transmission. Rep. of the Intern. Med. Cong., London, August, 1881; *cfr.* these ARCHIVES, x, p. 336.

865. UHTHOFF (Schöler's ophthalmic clinic). A contribution to sympathetic ophthalmia. *Deutsche med. Wochenschr.* of Börner, 1881, No. 33. Two cases. 1. Sympathetic plastic irido-choroiditis six weeks after a perforating sclero-corneal wound; seven weeks later, iridectomy preserving V— $\frac{1}{4}$. 2. The author found a circumscribed, rather large, spindle-shaped swelling in a ciliary nerve of an eye which had been enucleated for sympathetic ophthalmia; the swelling consisted of masses of micrococci. Sympathetic ophthalmia had set in three weeks after the injury.

866. WEBSTER, DAVID. Sympathetic neuro-retinitis. *N. Y. Med. Rec.*, March 5, 1881. Two cases of this kind: one due to a phthisical stump, after an injury; the other, to symblepharon. SWAN M. BURNETT.

IV.—LENS.

867. ARMAIGNAC, H. Cataracte traumatique chez un homme de trente quatre ans, résorption du cristallin, atrophie partielle du nerf optique ; diminution considérable du champ visuel et de la vision. *Rev. d'Ocul. du Sud-ouest*, vol. ii, No. 10, p. 221.

868. ARMAIGNAC, H. 1. Cataracte congénitale double, adhérente à gauche ; atrésie pupillaire des deux cotés résistant à l'action de l'atropine ; microphthalmus ; nystagmus continuel ; strabisme bilatéral en haut et en dedans ; absence complète de fixation. Extraction du cristallin à gauche, iridectomie à droite, amélioration de la vue. *Rev. d'Ocul. du Sud-ouest*, vol. ii, No. 10, p. 241. 2. Cataracte congénitale double ; hérédité morbide remarquable ; opération à l'âge de 29 ans. Traumatisme de l'œil quatre mois après l'opération ayant occasionné la rupture complète de la plaie cornéenne et l'issue de l'iris et du corps vitré. Guérison rapide et conservation de la vue. *L. c.*, p. 246.

869. V. BECKER. Cases of axial cataract. *Finska läkar. handl.*, vol. xxxiii, 1, p. 45.

870. MICHEL. The influence of disturbed circulation of the carotid on the eye. *Contrib. to Ophth.*, Bergmann, Wiesbaden, 1881. Disturbances of longer duration, like sclerosing atheromatous changes of the walls of the blood-vessels, mainly affect the nutrition of the lens, as is shown by the description of fifty-three cases of this kind.

871. NETTLESHIP, E. Dislocation of opaque lens between sclerotic and ciliary body. *Trans. Oph. Soc. of United Kingdom*, i, 24.

Nine years after a lacerated wound of cornea and iris the opaque shrunken lens passed forward into the anterior chamber, and from thence (when patient was recumbent) upward out of sight into a large pouch formed by separation of upper part of ciliary body from sclerotic. It was freely movable. Successful downward extraction.

E. NETTLESHIP.

872. PILONI (Montalcino). Sopra un caso di cateratta. *Boll. d'Ocul.*, vol. iv, No. 1, Sett. 1881, 1. Cfr. *Rev. d'Ocul. du Sud-ouest*, vol. ii, No. 12, p. 273.

873. SAMELSOHN (Cologne). The current of liquids in the lens. *Z. M. f. klin. A.*, vol. xix, p. 265. In three cases of opacities of the lens due to embedded particles of iron, the author found immediately under the capsule a circle of round brown spots regularly situated at equal distances from each other, and corresponding to the pupil when dilated at maximum, while not a particle had penetrated beyond toward the æquator. A migration of the spots could be observed, in course of which the points of the radiations finally united with the spots of the external ring. The author therefore assumes that the great current flowing from behind is checked in Petit's canal and thence enters the æquator of the lens, through which it passes in a centripetal direction, then collects at the anterior pole, whence it flows in a centrifugal direction toward the suspensory ligament, where it leaves the lens and enters the posterior chamber.

874. THEOBALD, SAMUEL (Baltimore). Total congenital dislocation of the lens with preservation of useful vision. *Amer. Ophth. Soc. at Newport*, 1881. There was also corectopia. In upright position the patient's

V with $+ 24 - \frac{1}{4}$ in the right eye. When he bent his head forward, he could read Jaeger No. 1 at $1\frac{1}{4}'$ distance. There was myopia of about $\frac{1}{4}$.

SWAN M. BURNETT.

875. ULLMAN, G. Contribution à l'étude de l'étiologie de la cataracte, 102 pages. Paris, 1881, Delahaye & Comp.

876. WORDSWORTH, J. C. **Case of simultaneous subconjunctival dislocation of both crystalline lenses, caused by the kick of a horse.** (*Roy. Lon. Oph. Hosp. Rep.*, vol. x, pt. 2, p. 204. June, 1881.) Patient was knocked down, the bones of his nose were fractured and both eyes ruptured. The lens in each eye lay under the conjunctiva, at upper and inner side of margin of cornea. Laceration in sclerotic was concentric with upper and inner margin of cornea. There was a good anterior chamber. The pupils were drawn upward, and were occupied by dark clots. Two weeks after admission, lens was removed by dividing conjunctiva. Patient left hospital in a few days, and was again admitted a few months later for choice of glasses. Right eye, $V - \frac{2}{30}$ with $+ 10.5$ D. Left eye, $V - \frac{2}{30}$ with same glass.

V.—VITREOUS BODY.

877. BEYER. Persistent hyaloid artery, Cloquet's canal, and fissure at the entrance of the optic nerve. *Prag. med. Wochenschr.*, No. 34 and 35.

878. BRAILEY. Seven cases of **suppurative hyalitis.** *Roy. Lond. Ophth. Hosp. Rep.*, vol. x, 2, p. 225.

879. CHARNLEY, W., and FOX, L. WEBSTER. **Three cases of new formation of blood-vessels in the vitreous.** *Roy. Lond. Ophth. Hosp. Rep.*, vol. x, pt. 2, p. 193. June, 1881. Three interesting cases of this rarely-described condition, with two plates illustrating the appearances presented in Cases 1 and 2. C. and F. say they have been able to find only four cases of new formation of vessels in the vitreous visible with the ophthalmoscope, hitherto recorded. At the close of the paper they allude to a case which has been published since their article was written, in the *Centralblatt für praktische Augenheilkunde* for February, 1881. (The present Reporter has seen a well-marked example occurring in a case of hemorrhagic retinitis and resembling Case 3.)

FITZGERALD.

880. HEBB and BRAILEY. On the **phenomena of suppurative cyclitis and their relation to the migration theory.** *Roy. Ophth. Hosp. Rep.*, vol. x, 2, p. 269.

881. HUTCHINSON, JON. A case of **primary intra-ocular hemorrhage, etc., with remarks on the causes of the occurrence.** *Trans. Ophth. Soc. United Kingdom*, i, 26, 1881. A detailed account of, and commentary upon, a case in which multiple recurrent hemorrhages occurred into the retina and vitreous in a young man; first eye lost by glaucoma following the hemorrhage, second eye attacked two years later, with relapses of bleeding, but no glaucoma. *Sudden* occurrence of *very large* hemorrhages followed by *rapid absorption*. Constipation, liability to epistaxis, variable circulation, low arterial tension with dilated tortuous arteries, were the personal peculiarities. No albuminuria, no syphilis. Strong family history of gout. The author thinks it probable

that this peculiar disease, of which he has seen and appends other cases, is very often associated with gout ; that the male sex, period of puberty, and a liability to rapid changes of vascular tension from various causes, are predisposing conditions ; any temporary cause of turgescence, especially during the recumbent posture, determining the rupture of vessels whether in the eye or nose. He does not attach quite so much importance to constipation as the starting-point, as does Mr. Eales in his valuable paper on the same subject (*Birmingham Medical Review*, July, 1880). (See a second paper by Eales at Internat. Med. Congress, London, 1881.) E. NETTLESHIP.

VI.—RETINA AND FUNCTIONAL ANOMALIES.

882. DEBIERRE, L. Du décollement rétinien et de son traitement. 76 pages. Paris, 1881. Delahaye and Comp.

883. DICKINSON, W. Hemiopia : mechanism of its causation on the theory of total decussation of the optic tracts at the chiasma. *Amer. Alienist & Neurologist*, April, 1881. Well-known theoretical deduction.

884. DICKINSON, W. and POLLACK. Cases of glioma. *St. Louis Med. & Surg. Journ.*, vol. xi, 1, No. 3, p. 255.

885. EALES (Birmingham). Primary retinal hemorrhages in young people. Rep. of the Intern. Med. Congr., London, Aug., 1881. These ARCHIVES, x, p. 338.

886. FERRIER, DAVID. Cerebral amblyopia and hemiopia. *Brain*, Jan., 1881, pp. 456-477. (Communicated to the British Medical Association at Cambridge, Aug., 1880.)

Recent experiments by the authors and Prof. Gerald Yeo showed that in monkeys (1) complete permanent blindness could only be produced by total destruction of both angular gyri and both occipital lobes ; (2) destruction of both occipital lobes had no discoverable effect on V (in opposition to Munk) ; (3) destruction of one angular gyrus caused blindness of opposite eye, but only for a few hours ; (4) simultaneous destruction of both ang. gyri caused blindness of both for a few days, followed by gradual return of vision, but perhaps not perfect ; (5) destruction of ang. gyrus and occipital lobe, same side, caused hemiopia of both eyes. Probably, therefore, there is a twofold relation between eyes and cortical visual centres : one crossed by the angular gyrus ; the other bilateral, by the occipital lobe in conjunction with the ang. gyrus. The cross amaurosis from lesion of ang. gyrus is, like that in cerebral hemianæsthesia, due to lesion of fibres of posterior third of internal capsule ; hence, probably, these fibres are in special relation with the ang. gyrus and represent the opposite eye.

F., from his own experiments (5) and from consideration of Munk's experiments (hemiopia from destruction of one occipital lobe) and of various published cases, concludes in favor of the recent suggestion that hemiopia may be due to occipito-angular cerebral lesion, as well as to disease of optic tract. It is, he thinks, probable that in cerebral hemiopia central vision is always retained over an area of a few degrees, and better in the eye opposite to the lesion, but in peripheral hemiopia (optic tract or corp. genic.) the defect extends over exactly half the field. F. also discusses the question of recovery from hemiopia in them, and gives a case of probable partial recovery. Cases (with field-charts) of amblyopia in hemianæsthesia are also given. E. NETTLESHIP.

887. GILLE. Hemiopie avec hémiplegie. Paris, 1881. Delahaye and Comp.

888. GOWERS, W. R. Case of optic neuritis with paralysis of upward movement of eyes. *Trans. Ophth. Soc. of United Kingdom*, i, 117, 1881.

F., 23 ; headache 2½ years, weakness of legs, occasional vomiting, a few fits, double optic neuritis with bad vision, no power of moving eyes upward, pupils nearly motionless, accommodation nearly abolished. Possibly tumor of middle lobe of cerebellum. E. NETTLESHIP.

889. GREENHILL. On the meaning of the words "Nyctalopia" and "Hemeralopia," with a critical examination of the use of these words in the ancient Greek and Latin authors. *Roy. Lond. Ophth. Hosp. Rep.*, vol. x, p. 284.

890. HASSENSTEIN, R. Homonymous amaurosis after injury of the skull, cured by trephining. *Inaug.-Dissert.*, Königsberg, 27 pages, June, 1881.

891. HENSE. Hemianopsia in injuries of the skull. *C. f. A.*, vol. v, p. 204, 2 cases. In one, left-sided hemianopsia with a sharp limit in the vertical meridian, due to a shot in the right side of the forehead. The second case was caused by a fall upon the head and fracture of the skull (where ? Rep.) giving rise to right-sided hemianopsia with incomplete amaurosis of the half of the field of vision in question of the right eye. The author assumes circumscribed hemorrhage as the cause, which had compressed one optic tract before entering the chiasma.

892. HIRSCHBERG. One-sided neuro-retinitis with retinal hemorrhages in both eyes after severe hematemesis. *Ber. der Heidelb. Ophth. Vers.*, Sept., 1881. The swelling soon subsided, but the inflamed optic disc afterward became atrophic. Three years later the patient died after another attack of pulmonary hemorrhage, but no traces of a former hemorrhage into the vaginal space of the optic nerve could be found.

893. PARINAUD. De l'héméralopie dans les affections du foie et de la nature de la cécité nocturne. *Arch. génér. du Med.*, April, 1881.

894. PEUNOFF, A. J. Retinitis interstit. circumscripta hyperplastica. *Medic. Sbornik. Ausg. d. Kaiserl. kaukas. med. Ges.*, 1881, No. 32. The author describes 3 cases from Hirschmann's clinic and a case of his own from the military hospital in Tiflis ; all are classified as retinitis proliferans. The essential feature is the formation of membranes, which take their origin partly in the retina, partly in the papilla, overspread the retina, and protrude into the vitreous. In two cases the membrane contained blood-vessels, whose connection with the retinal vessels could be clearly traced in only one case. Twice there was neuro-retinitis beyond a doubt. Twice both eyes were affected, twice only one. In one case syphilis was the cause; in two, iritis; and in one, choroidal changes had previously existed. Hemorrhages into the vitreous could not be demonstrated in all cases. After careful consideration of his cases and those of Jaeger, Hirschberg, Manz, and Leber, Peunoff comes to the conclusion that retinitis proliferans (Manz) is not a distinct disease, but the possible result, in some cases a stage of parenchymatous retinitis, that its extent is generally limited, and that the repeatedly observed hemorrhages into the vitreous are not without influence upon the formation of the membranes. The author

would like to adopt the name proposed by Reich "Retinitis interstitialis hyperplastica circumscripta." The improvement obtainable is but limited.

HIRSCHMANN.

895 a. PONCET. Communication relative à l'héméralopie. *Gaz. des Hôpitaux*, 1881.

896. SCHIRMER, R. Macropsy and micropsy (Encyclop. Art.). *Eulenberg's Real-Encyclop. d. ges. Heilk.*, vol. viii, p. 525.

897. STEINHEIM. Temporal hemianopsia. *C. f. A.*, vol. v, p. 233
It was caused in a man 40 years old by a tumor arising from the palate, which on account of the accompanying cerebral symptoms made the existence of an intracranial proliferation at the anterior angle of the chiasma very probable. No autopsy.

898. TREITEL. Sharply defined recurrent temporal hemianopsia; paralysis of the right oculomotor and trochlearis nerves and of the left facial nerve. Recovery. *A. f. A.*, vol. x, 4, p. 460. It was observed in a woman 27 years old, who had married a syphilitic man. It soon disappeared, leaving only a paracentral scotoma. Later, periostitis of the right frontal bone, paralysis of all the branches of the oculomotor nerve and of the trochlearis; while in the left eye, with V — 1, only the facial nerve was paralyzed, though there was a considerable defect in the lower-outer quadrant and a large scotoma in the upper-outer quadrant. Cured by inunction. The author is inclined to accept syphilitic periostitis at the base of the skull and partial compression of the chiasma as the cause.

899. TAY, WARREN. Peculiar changes at the yellow-spot region in each eye of an infant. *Trans. Ophth. Soc. of United Kingdom*, i, 55, 1881. (With plate.)

Changes in retina at each *macula*, like those in early period of retinal embolism, but papillæ and retinal vessels normal; 4 months later papillæ becoming *atrophic*, but changes at maculæ unaltered. Child æt. 12 months, weak, listless, unable to hold head up; but no definite disease made out; sight thought to be rather defective. (Plate of ophthalmoscopic changes.) E. NETTLESHIP.

900. DE VINCENTUS. Sul glioma della retina. *Ann. d'Ottalm.*, vol. x, Fasc. 4 and 5. Five accurate clinical histories with the result of the autopsy and the microscopic examination of the tumor. The children were 3, 4, 6, 7, and 8 years old. DANTONE.

901. WILBRAND (Hamburg). Hemianopsia and its relation to the localization of diseases of the brain. Hirschwald, Berlin, 1881, 214 pages. A critical investigation, with a careful consideration and lucid classification of the material, so far as it relates to this affection and the cerebral diseases connected with it. Good book for reference.

VII.—OPTIC NERVE.

902. CATON, R. Case of uni-ocular optic neuritis with symptoms of cerebral tumor. *Liverpool Medico-Chir. Jour.*, July, 1881, p. 28.

Man, 28, with severe left-sided headache, vertigo and vomiting. Optic disc in left eye congested, and V failed down to 0. Paralysis of left third nerve.

Gradual recovery ; sight of left eye not completely restored for a year. Old depressed fracture on right side of skull. No syphilis.

903. CRITCHETT, G. A., and STURGE, W. A. Intra-ocular tumor following symptoms of cerebral tumor. *Trans. Ophth. Soc. of the United Kingdom*, vol. i, p. 136, 1881. Man, 26 years old ; severe headache, vomiting, double vision, optic neuritis going into atrophy ; recovery from head symptoms. At 30 the right eye showed slight proptosis, detachment of retina, and hemorrhage into the vitreous ; T +. E. NETTLESHIP.

904. HAASE. Embolism of the central retinal artery. *A. f. A.*, vol. x, 4, p. 469. (1) Within 6 months second attack of blindness on the same eye with all the symptoms of embolism ; complete recovery. (2) In a patient with heart disease, 10 years before the second attack, loss of sight in the right eye from embolism, from which he recovered, and now of the left eye, with complete restitution in two weeks. (3) Sudden blindness in a patient with hypertrophy of the left ventricle, caused by embolism of small branches of the retinal artery, and ending in glaucoma.

905. MICHEL. The affections of the sheaths of the optic nerve. Paper read before the Phys.-med. Soc. of Würzburg. *Sitzungsber.*, No. 7. 1881.

906. OLIVER (Edinburgh). Sudden loss of sight in neuritis. (*Med. Times and Gazette*, May 21, 1881, p. 577.) O. suggests in answer to a paper of Dr. Hughlings Jackson that the sudden loss of sight in neuritis with no aggravation of the ophthalmoscopic signs may be due to a rise of tension in the eye. FITZGERALD.

907. SAMELSOHN (Cologne). The pathological changes in retrobulbar neuritis. Rep. of the Intern. Med. Congress, London, Aug. 1881. These ARCHIVES x, p. 339.

908. SCHÜLLER. Contributions to the pathology of the optic nerve. *C. f. A.*, vol. v, p. 236, and *Inaug.-Diss.*, Berlin, 1881. Atrophy of the optic nerve due to a deformity of the skull (turreted skull) ; the left eye was amaurotic. A brief report of the 4 cases thus far recorded is added. It is doubtful whether in the typical cases optic neuritis has always existed, or whether hyperostosis at the optic foramen has destroyed the power of transmission and caused atrophy of the optic nerve. 3 cases of traumatic atrophy of the optic nerve. One due to a thrust with a rapier. Absence of the upper half of the field of vision. Three weeks later atrophy began. 2 cases of contusion of the globe resulting in amaurosis and atrophy.

909. STREATFIELD. Orbital tumor with optic neuritis in both eyes. *Trans. of the Ophth. Soc. of the United Kingdom and Brit. Med. Journ.*, April 9, 1881. Case of a boy 12 years old, who probably had a tumor of the left frontal bone, which had grown inward and thus exerted a pressure upon the optic nerves and the brain. FITZGERALD.

VIII.—INJURIES, FOREIGN BODIES (PARASITES).

910. BERLIN. Traumatic lesions of the optic nerve and the ophthalmic artery within the optic canal. *Sitzungsber. d. Heidelb. Ophth. Vers.*, Sept., 1881. The author found in one case a rent in the intracranial part

of the optic nerve. It went through the whole nerve, had torn the sheath, and severed the ophthalmic artery. Referring to the history of sudden amaurosis after contusions of the forehead, etc., and fractures of the skull, he calls attention to the fact that as early as 1845 Nuhn sought to explain it by an injury or rent of the optic nerve within the optic foramen.

911. COHN, HERM. **Five extractions of cysticercus from the eye** with demonstration of the cases. *Bresl. ärztl. Zeitsch.*, 1881, No. 23 and 24. He operated according to Graefe's method, and succeeded in preserving sight, partly in some cases, entirely in others, while in all the shape of the globe remained perfect. Finally he mentions the symptoms distinguishing cysticercus from (1) iritis, (2) sudden cloudiness of vision, (3) a white spot in the fundus of the eye, (4) detachment of the retina.

912. GAYET. **De l'expulsion totale de l'iris par un choc sur le globe oculaire, et d'une difformité temporaire du cristallin.** *A. d' Ophth.*, vol. i, p. 419. Injury of the right eye by a fall upon the edge of a table. After the extensive ecchymosis had been absorbed, the iris was found at some distance from the upper inner edge of the cornea, under the conjunctiva, in the neighborhood of the scleral wound. Ciliary processes clearly visible. Lens clear and not dislocated, but a change in the curvature recognizable with the ophthalmoscope at a point opposite the rent in the sclera, which afterward disappeared. It could not be determined whether there was a partial elevation or depression of the surface of the lens. After reporting briefly two cases of partial detachment of the iris the author tries to explain the mechanism of these injuries by assuming that in the first place the trauma causes a contraction of the muscular elements of the iris and thus easily detaches the stretched membrane from its ciliary insertion, where it is thinnest. v. MITTELSTÄDT.

913. HERDEGGEN. **So-called commotis retinae.** These ARCHIVES, x, p. 399. The author begins by critically examining the cases thus far reported. He inclines toward the view of Berlin, who, in the majority of cases of this kind, assumes pathological changes in the retina, which in some have been shown to exist, but cannot be the cause of the visual disturbances. The slight temporary disturbance of central vision may be ascribed to transient astigmatism and myopia, produced by a spasm of the ciliary muscle.

914. LEBER. **The action of foreign bodies within the eye.** Rep. of the Intern. Med. Congr. London, Aug., 1881. These ARCHIVES, x, p. 333.

915. RAVA. **Nuove comunicazioni ottalmologiche.** *Ann. d' Ocul.*, vol. x, Fasc. 4 and 5. Three cases of peculiar injuries. 1. **Rupture of the choroid after a blow** from a blunt object, producing only a very slight hemorrhage and not injuring the other membranes at all. Its direction was from above downward and outward from the disc; its length 5-6 diameters of the papilla, and its breadth $\frac{1}{2}$ mm. 2. **A shot encysted in the retina and choroid**, visible with the ophthalmoscope. It had entered 6 mm, from the outer edge of the cornea. The irritation soon disappeared, leaving V — $\frac{1}{4}$. Though observed for 1 $\frac{1}{2}$ years, no further changes were noticed. 3. **Piece of gun-cap in the papilla behind the lamina cribrosa.**

916. SCHENKL. **Rupture of the globe by pressing upon it after an operation for glaucoma.** *Prag. med. Wochenschr.*, vol. vi, 1, p. 11.

917. SCHIESS-GEMUSEUS. Rupture of the choroid produced by a blow with a stick; 17. *Jahresber. d. Augenheilanst zu Basel*, 1881. V — $\frac{1}{2}$ remained.

918. TREITEL. Injury of the optic nerve within the orbit with complete loss of sight, the globe itself remaining intact. *A. f. A.*, vol. x, 4, p. 464. A sword-thrust was the cause, which, besides the amaurosis, produced paralysis of the inferior rectus muscle. Diffuse opacity of the retina around the disc. Two weeks later atrophy of the papilla began. Probably the orbital part of the optic nerve was injured prior to the entrance of the retinal blood-vessels.

IX.—OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

919. ANDERSON, MCCALL. Tumor of 4th ventricle causing double ophthalmoplegia. *Edinburgh Med. Jour.*, Sept. 1881, p. 209.

The patient, a man, began to suffer from left internal squint, æt. 34; drowsiness and stupor came on for some time; then vertigo; then attacks of headache, hiccough, and profuse viscid salivation lasting many hours; and some difficulty of swallowing and paresis of one facial nerve. The ocular paralysis slowly increased, involving all the extrinsic muscles of both eyes. No disease of optic papilla. Death three years after onset of symptoms. Glioma of medulla oblongata projecting into floor of 4th ventricle and largest on right side. E. NETTLESHIP.

920. BARLOW. Case of pneumonia with endocarditis. *Med. Times & Gaz.*, Feb. 12, 1881, p. 187. Among the complications mention is made of meningitis and retinal hemorrhages.

921. BRAILEY, W. A. and EDMUNDS, WALTER. The relation of the retinal changes to the other pathological conditions of Bright's disease. *Trans. Ophth. Soc. United Kingdom*, i, 44. 1881. With plate.

In patients dying of chronic Bright's disease the authors found changes in the small arteries of the retina, choroid, optic nerve, kidneys, and other parts. In the retina there may be: (1) thickening and hypernucleation of arteries and capillaries without narrowing of lumen; (2) hyaline thickening [or later stage of (1)]; (3) in localized areas, generally where retina shows the characteristic macroscopic changes of Bright's disease, great concentric thickening chiefly of the subendothelial part of the intima, with narrowing or obliteration of lumen. In the kidneys the arteries show some obliterative hypertrophy in a high degree. The arterial disease probably precedes the inflammatory and degenerative changes in the surrounding tissues, both of the kidney and retina. Degenerative hypertrophy of arteries and capillaries also found in many local eye diseases.

E. NETTLESHIP.

922. BULL, C. S. Some points on the pathology of ocular lesions in cerebral and spinal syphilis. *Amer. Jour. of Med. Science*, April, 1881. Bull reports 5 cases: 1. paresis of the left superior rectus, temporary ptosis, paraplegia, atrophy of the optic nerve in consequence of neuritis; 2, paresis of the right oculomotor nerve and superior oblique, afterward white atrophy of the optic nerve; 3, optic neuritis terminating in atrophy of the right optic nerve; 4, ptosis of the left eye, neuritis in both; 5, paresis of right inf. rect., ptosis dext., deafness in one ear, diminished hearing in the other, atrophy of the right optic nerve.

SWAN M. BURNETT.

923. BULL, OLE B. **The pathological changes in the fundus of the eye dependent upon syphilis.** Christiania, 1881, 103 pages. (1) Hyperæmia of the optic nerve, pp. 1-26, was frequently observed by the author as a symptom of recently acquired syphilis, but never later than two years after infection. At the same time slight swelling of the retina around the disc, especially above, below, and inward, but without essential functional disturbances. The author found it 160 times in 800 cases of constitutional syphilis. (2) Optic neuritis and atrophy is but very rarely the direct consequence. (3) Changes in the retina and choroid first manifest themselves as photopsias. Frequently there are scotomas or defects of half the field of vision ; micropsia, rarely macropsia. One of the most constant symptoms is the reduction of the sense of light. The loss of visual power, however, is generally greater than that of the sense of light (contra Förster). The reduction of color-perception is only the consequence of that of the perception of light. All these pathological changes are due to an affection of the retina, in defence of which view the author cites : (1) the shape and location of the scotomas, which radiating from the optic nerve frequently only extend to the vertical bisecting line and there end abruptly. (2) At first there are no changes in the choroid ; (3) the bright spots which are due to atrophy of the layer of pigment belonging to the retina are most numerous where formerly the scotomas were ; (4) the atrophic spots not seldom seem to be connected with the retinal blood-vessels. Retino-choroiditis occurs in about 8-10 per cent. of all cases of syphilis. Report of a large number of cases. SCHIÖTZ.

924. DREWES. Contribution to the statistics and diagnosis of syphilitic affections of the eye. *Inaug.-Diss.*, Berlin, 1881.

925. EALES, H. **Central amblyopia in diabetes.** *Lancet*, July 30, 1881, p. 200.

A man, 50, suffering from diabetes had V less than $\frac{15}{100}$ Sn., central amblyopia for colors. Vision better in dull light ; no ophthalmoscopic changes. E. (alluding to a previous paper) believes he was not a smoker. He died shortly afterward and no further details were obtained. E. NETTLESHIP.

926. GRADLE, H. **Spasm of the ciliary muscle of central origin.** *Journ. of Nervous and Mental Disease*, July, 1881. Shortly after an apoplectiform attack an examination with the ophthalmoscope and glasses showed myopia of 1.5 D, which disappeared under atropia. The author assumes a connection between the brain-disease and the spasm of accommodation.

SWAN BURNETT.

927. MCHARDY, M. M. **Tumor involving optic chiasma only.** *Trans. Ophth. Soc. of United Kingdom*, i, 128, 1881.

F., 35, deaf from infancy ; severe thirst 7 months, failure of V and headache 3 months. Unsteady shuffling gait with tendency to fall backward and to left, emaciation, voice weak, articulation slow, smell and taste good, advanced atrophy of discs with no proof of papillitis, temperature always subnormal. Urine normal. Death after noisy delirium 10 months after symptoms began. Firm, reddish, small tumor involving commissure, optic tracts, and inner roots of olfactory nerves. Microscopically it resembled a syphilitic growth.

E. NETTLESHIP.

928. HUGHLINGS-JACKSON. **On eye symptoms in locomotor ataxy.** *Trans. Ophth. Soc. United Kingdom*, i, 139-154, 1881.

Three eye symptoms, viz : paralysis of oculomotor nerve trunks, alterations of pupil, and optic atrophy were considered in relation to three non-ocular symptoms, viz : lightning pains, absence of knee reflex, and ataxic gait. The paper was based on 25 cases. Oculomotor paralysis preceding other tabetic symptoms is sometimes permanent, a case quoted which J. had known for 6 years. The common pupillary change is the "Argyll Robertson pupil," in which reflex action is lost and associated action retained ; it may be absent in ataxy. It is seldom present without absence of knee reflex in ataxy, but it may be present without any other symptoms of nerve disease. A case detailed in which knee reflex was absent, there was persistent mydriasis, without cyclophlegia, in one eye, pupil and accommodation of other being normal. Optic atrophy may precede pains and ataxic gait even for several years. The limitation of field in this atrophy may "correspond roughly to certain ocular deviations from cerebellar disease, in the way that hemiopia does to lateral deviation of the eyes from cerebral disease." Atrophy was present in 12 of the 25 cases, and knee reflex absent in 9 of the 12. Atrophy recognized as the earliest symptom in only one of 19 cases. Proportion in which knee reflex disappears before any other symptoms, is unknown.

E. NETTLESHIP.

929. HUGHLINGS-JACKSON. **Relation between optic neuritis and intracranial disease.** *Trans. of Ophth. Soc. of the United Kingdom*, vol. i, pp. 60-115, 1881. Elaborate paper based upon a large number of cases, upon the question of the connection between optic neuritis and intracranial affections, in which he thoroughly discusses the present theories of their pathogeny and etiology, and then seeks to explain optic neuritis himself by considering it to be the double indirect result of the gross cerebral disease, which causes instability of the surrounding gray matter, as shown by epileptiform seizures, muscular spasms, etc.; in an analogous manner contractions and paralytic dilatations of the vessels of the optic nerve occur, and give rise finally "to that trouble of nutrition which is optic neuritis." He, however, doubts the validity of this hypothesis for neuritis from tubercular meningitis. A lively debate followed.

E. NETTLESHIP.

930. KIPP, J. On eye affections from malarial poisoning. *Trans. of the Med. Soc. of New Jersey*, 1881. The observations were made after the high fever had subsided, and mainly upon affections of the cornea. These chiefly consisted in longitudinal infiltrations, with but a slight tendency to deepen ; they form superficial ulcers, which may destroy a large part of the cornea; there is generally no hypopyon or chemosis, and the iris is affected to a varying degree.

SWAN BURNETT.

931. KNAPP, H. Quinine amaurosis. These ARCHIVES, x, p. 220. *Sitzungsber. d. Heidelberger Ophth. Ges.*, Sept., 1881.

932. LEBER. **The connection between optic neuritis and intracranial diseases.** Rep. of the Intern. Med. Cong., London, Aug., 1881. These ARCHIVES, x, p. 338.

933. LITTLE, W. S. **Symptoms (reflex) in and about the eye, due to some affection of the uterus or its appendages.** *Phila. Med. Times*, June 18, 1881. Three cases of kopiopia hysterica (Förster). The symptoms disappeared immediately after the removal of the uterine trouble.

SWAN M. BURNETT.

934. **MACKENZIE, S.** Two cases of fatal idiopathic pernicious anæmia with retinal hemorrhages. *Trans. Ophth. Soc. United Kingdom*, i, 48, 1881. With plate.

Case 1 (male, æt. 59). Multiple hemorrhages occurred in both retinae, and were absorbed, but recurred after some weeks. Many were white at the centre as soon as three or four days after occurrence.

Case 2 (male, æt. 18). General symptoms at first thought to indicate scurvy (cutaneous petechiæ, bleeding gums). Gradually increasing retinal hemorrhages in both eyes, with œdema and blood-staining of retinae. Plate showing progress of hemorrhages at six different dates. E. NETTLESHIP.

935. **MANDELSTAMM.** Two cases of metastatic inflammation of the eye in childbed. *Z. M. f. Klin. Augenhlk.*, vol. xix, July, 1881, p. 285. 1. In a woman 52 years old, who had been delivered 5 weeks ago, an extra-ocular abscess had developed near the int. rect.; plastic iridocyclitis, result amaurosis. 2. Similar condition in a woman suffering from puerperal fever, which developed two weeks after delivery. Result the same.

936. **MAUTHNER, L.** Neuro-retinitis in intracranial diseases. *Wien. med. Blätter*, vol. iv, 10-18. Mauthner distinguishes between choked disc and neuro-retinitis; in the former the inflammation concentrates itself upon the papilla, in the latter upon the retina. Critical review of the various theories. Retinitis albuminurica and retinitis due to lead poisoning never present the appearance of true choked disc, so that when the latter is observed, an affection of the brain caused by the poison must be assumed.

937. **MICHEL, J.** Case of stenosis of both carotids with sudden amaurosis, presenting the picture of ischæmia and œdema of the retina, and a case of thrombosis of the right carotid, quickly followed by amblyopia of the right eye, which presented the ophthalmoscopic appearances above mentioned. *Ophthalmological contributions at Horner's jubilee*, Abh. i. J. F. Bergmann, Wiesbaden, 1881.

938. **MOOREN, A.** Visual disturbances and uterine diseases. *A. f. A.*, vol. x, pp. 519-602. On the strength of his large clinical experience the author declares that there is no part of the eye which, either from a physiological or pathological point of view, is beyond the influence of the uterine system. The reflex theory is accepted to explain the reciprocal relations between these organs. For particulars see the article itself.

939. **NETTLESHIP, E. and EDMUNDS, WALTER.** Cases of central amblyopia in diabetes, with microscopical examination of optic nerve in one case. *Trans. of the Ophth. Soc. of the United Kingdom*, vol. i, p. 124, 1881, with plate.

Case 1. M., 52, advanced diabetes in a smoker. Well-marked central scotoma symmetrical in both eyes. Death. Sclerotic inflammation with atrophy of nerve fibres, in a tract of the nerve extending down its whole length (nerve not examined on brain side of optic canal); posteriorly this tract was nearly at centre of nerve, farther forward it appeared at or near the surface of the temporal part of the nerve; no changes seen anterior to lamina cribrosa. (Plate.)

Case 2. F., 30, advanced diabetes, slight amblyopia and small central scotoma. Result unknown. E. NETTLESHIP.

940. NIEDEN, A. Contributions to the knowledge of the connection between the affections of the brain and of the eye. *A. f. A.*, vol. x, p. 603 ff. 1. Fibrosarcoma of the right cerebral hemisphere, optic neuritis and atrophy of the papilla in both eyes caused by an injury (detachment of the lamina vitrea). Death two years after blindness had set in under epileptiform symptoms. 2. Gliosarcoma of the pons and medulla of the right side, paralysis of the associate movements (conjugate deviation) of the eyes, slight optic neuritis of both eyes, paralysis of the right facial nerve, left-sided hemiplegia. He argues for the assumption of a centre of innervation governing the synergetical action of the superior oblique and inferior rectus muscles. 3. Cystoid degeneration of the right side of the cerebellum, optic neuritis, especially in the left eye, slight disturbances of co-ordination, sudden death. 4. Progressive paralysis gray atrophy of the optic nerve, 3 years before the commencement of the psychosis. No spinal symptoms. (Atrophy of the occipital lobe of the right cerebral hemisphere.) The right eye was the last to be affected.

MISCELLANEOUS NOTES.

APPOINTMENTS.

DR. JAS. A. SPALDING, so well known to our readers by his original contributions and able translations, has been appointed ophthalmic surgeon to the Maine General Hospital at Portland.

THREE NEW OPHTHALMOLOGICAL JOURNALS.

1. *The Ophthalmic Review*, a monthly record of ophthalmic science, edited by K. GROSSMANN and PRIESTLY SMITH. London: Churchill. Five numbers have appeared thus far, each containing short original papers, selected abstracts, and a bibliography. Price 1s. the number, 12s. the volume.

2. *Revue générale d'ophtalmologie*, recueil mensuel bibliographique, analytique et critique, dirigé par le Prof. DOR à Lyon and le Dr. E. MEYER, à Paris.

The English review seems to have chosen *Zeh. Klin. Mon.*, the French *Hirschberg's Centralblatt* as a pattern.

3. *A Journal of Comparative Ophthalmology*, by Prof. BERLIN and Dr. EVERSUSCH of Stuttgart, is to appear shortly. Vogel, Leipzig, publisher.

ERRATA.

Page 13, ninth line from head, and thirteenth line from foot, should read *cmm.* instead of *ccm.*

Page 110, at the end of No. 651, the name of the reviewer of Dr. Ayres' paper should be BURNETT, not AYRES.

ARCHIVES OF OPHTHALMOLOGY.

THE CLINICAL SIGNIFICANCE OF THE SO-CALLED AMYLOID TUMORS OF THE CONJUNCTIVA, WITH A REPORT OF THREE NEW CASES.

BY DR. THEODOR KUBLI, OF DORPAT.

Translated by JAMES A. SPALDING, M. D., Portland, Maine.

I.—*Cases of so-called amyloid tumor of the conjunctiva.**

IN the subjoined compilation of cases I have chiefly considered their clinical phenomena, and have given less notice to the histology and pathology, for which I refer the reader to the original papers, above all, the latest of them, that of Prof. Raehlmann, published in the previous volume (x, p. 171, etc.) of these ARCHIVES, under the title of "Amyloid Degeneration of the Conjunctiva."

Case 1.—Oettingen: Die ophthalmologische Klinik Dorpat's, 1871, page 49, etc. Kyber: Studien ueber die amyloide Degeneration; erste Abth., 1871.

Case 2.—Oettingen: *l. c.*, p. 51. Kyber, *l. c.*, p. 135.

Case 3.—Saemisch: Sitzungsberichte der Niederrhein. Gesellsch. f. Nat., etc., March 17, 1873; Bonn. H. Vogel: Ueber Perichondritis des Tarsal-Knorpels; Inaug. Diss., Bonn, 1873, p. 13.

Case 4.—Leber: *Graefe's Archiv*, Band xix, Abth. 1, p. 163.

Case 5.—E. J. v. Becker: Amyloid Degeneration af tarsi. Finska Läkaresällskapet's Handlinger, Band xvii, 1874.

* The report of the previously published cases has been suppressed in the English version of this paper; the bibliography, however, is left. A well-marked case published by Drs. Prout and Bull in these ARCHIVES (vol. viii, p. 73, etc.) has been overlooked by the author.

Mentioned in Stroehmberg, "Ein Beitrag zur Casuistik der amyloid. Degen.," etc., p. 13, Dorpat, 1877.

Mooren, "Ophthal. Mittheil. aus d. Jahre 1873," Berlin, 1874, p. 27, has occasionally seen amyloid degeneration of the conjunctiva, although he reports no special cases, and seems never to have verified his diagnosis with the microscope.

Case 6.—Narkiewicz-Jodko: "Trzecie sprawozdanie z. Instytutu oftalmicznego," etc. Warsaw, 1874. This case has been translated by Zwingmann.

Case 7.—Braun: Annal. der chirurg. Gesellsch. zu Moskau, 1875.

Case 8.—Reymond: *Annali di Ottalmologia*, anno iv, 1875, p. 349.

Case 9.—Kyll: Die amyloide Degeneration, etc. Inaug. Dissert., Bonn, 1876, p. 21, etc.

Case 10.—Stroehmberg: "Ein Beitrag zur Casuistik der amyloiden Degeneration," etc. Dorpat, 1877, p. 16, etc.

Case 10a.—Zwingmann: "Die Amyloidtumoren der Conjunctiva." Inaug. Diss., Dorpat, 1879, p. 75, etc.

Case 11.—Zwingmann: *l. c.*, p. 23.

Case 12.—Narkiewicz-Jodko: Compare Zwingmann, *l. c.*, p. 21.

Case 13.—Quaglino and Guaita: *Annali d'Ottalmologia*, anno vi., 1877, p. 163.

Case 14.—Mandelstamm and Rogowitsch: *Graefe's Archiv*, Band xxv, Abth. i, p. 248.

Case 15.—Leber: *Graefe's Archiv*, Band xxv, Abth. i, p. 262.

Case 16.—Hippel: *Graefe's Archiv*, Band xxv, Abth. 2, p. 2.

Case 17.—Zwingmann: *l. c.*, p. 114.

Case 18.—Zwingmann: *l. c.*, p. 120.

Case 19.—Zwingmann: *l. c.*, p. 130.

Cases 20, 21, and 22.—Adamük: Three cases published in Russian. These ARCHIVES (German edition), vol. x, 448.

Case 23.—Zwingmann: *l. c.*, p. 150.

Cases 24 to 27.—Raehlmann: these ARCHIVES, vol. x, p. 171, etc.

CASE 28.—M. S., æt. 32, field laborer; has never been ill, and is at present in robust health. He has suffered for twenty years from persistent lachrymation and slight photophobia. The "proud flesh," as the patient calls it, which is visible between the eyelids of both eyes has been there, according to his statements, for twelve years, but has never previously caused him any trouble. In the last few weeks, however, the tumors have increased so much in size that they obscure the vision of both eyes. The patient has also suffered for the last fortnight with violent pain and photophobia in the right eye, accompanied with diminution of vision.

Right eye.—The lids are voluminous, and pushed evenly forward like a pillow. The upper lid droops a great deal. The opening of the lids, which is generally so slight as only to allow a narrow strip of the cornea to be visible, can with the greatest effort, and assistance of the muscles of the forehead, be enlarged sufficiently to uncover two thirds of the cornea and an overhanging reddish and glistening tumor. The tension of the lower lid is slight; of the upper lid, well marked. On palpation of the lids we feel in the deeper portions of the lower lid, and apparently attached to the tarsus, an elastic, yielding tumor; in the upper lid a knotty tumor, the inner half of which seems to be hard like cartilage. After easily everting the lower lid, the conjunctiva near the commissure of the eyelids is seen to be thickened, and of a grayish-yellow tinge, over an extent of 3-4 mm.; the surface appears slightly granular, although there are no true granulations or follicles present. Several striped and superficial conjunctival cicatrices begin at a distance of 3-4 mm. from the inner edge of the lid, extend directly to the conjunctiva of the globe, and terminate just beneath the limbus corneæ. The conjunctival fold which has thus been bridged over is filled up with a brownish-red, transparent, inelastic tumor having a smooth surface which is covered with several coarse vessels.

The plica semilunaris has degenerated into a knobby tumor half as large as a walnut (intimately connected with the tumor in the lower fold), embracing the conjunctiva of the eyeball, and extending from the inner commissure to the edge of the cornea. A slender process extends like a curtain from this tumor to the middle of the cornea. The surface of the tumor is smooth, marked with a few vessels, and of a dark red color. At the inner commissure, the tumor is elastic and coarse; at the curtain-like process inelastic and smooth. The upper part of the tumor passes off into a comb-

like projection which extends from the upper conjunctival fold and bulbar conjunctiva to the limbus corneæ and also gives off a curtain-like process downward. The projection then extends into the external commissure, where it unites with the tumor on the lower conjunctival fold. This portion of the tumor resembles the other in color and consistence.

The upper lid cannot be everted owing to its extreme tension. But when it is drawn as far as possible away from the eyeball, the conjunctiva is found to be thickened, brownish, and finely granular as on the lower lid. The thickening seems most marked toward the inner commissure, in correspondence with the hard nodule which is felt on palpation of the lid. The tumor, therefore, springs from the retrotarsal fold, the conjunctiva of the eyeball, and the plica semilunaris, and embraces the whole anterior segment of the globe in the form of a ring, in the centre of which lies the cornea. The upper and inner quadrant of the cornea, corresponding to the curtain-like projections of the tumor, is marked by a deep excavated ulcer, with ragged edges and infiltrated base.

The condition of the *left eye* is about the same: the tumor has the same form and occupies the same region. But it is a trifle smaller. The surface is glistening and smooth; the tint is brownish-yellow, wax-like, or glassy. Above, the tumor is elastic and coarse; elsewhere, elastic and soft. The cornea is not so extensively covered by the tumor as in the right eye. The inner portion shows a small and superficial loss of substance. S R $\frac{20}{100}$; S L $\frac{10}{100}$. Ref. both Em.

Therapeutics: Aug. 21, 1880.—*Right eye*: Those portions of the tumor which extended over the cornea and caused the ulceration of that tissue were excised.

Nov. 20th.—A piece as large as a bean was excised from the tumor on the lower fold.

Aug. 31st.—*Left eye*: The degenerated caruncle and plica semilunaris, which were then as large as the kernel of a walnut, were extirpated.

Sept. 19th.—The external commissure was divided, and two pieces as large as a bean excised from the tumor in that region. The operations were followed by slight hemorrhage. The after-treatment consisted in the application of a 2-per-cent. solution of boracic acid every two hours. A light antiseptic bandage was subsequently applied. The wounds healed in a day or two with-

out any reaction. After removing the overhanging portion of the tumor in the right eye, and using atropine, the corneal ulcer soon healed. An ulcer which made its appearance on the inner portion of the left cornea, after the removal of the tumor attached to the plica semilunaris and caruncle, recovered rapidly under the same treatment.

Every excision was followed by retrogressive metamorphosis in the remaining portions of the tumor. This process consisted in a very gradual diminution and shrivelling of the tumor, which, however, did not change very much except to become more yielding. The bunches which sprang from the conjunctival fold also shrivelled and left the conjunctiva in a nearly normal condition. When the patient was discharged, Dec., 1880, his condition was as follows :

The eyelids are still swollen, but not so much as before ; the ptosis of the upper lids is much diminished. The tarsus in both lids feels moderately thickened, and at the inner half of the right upper lid is as large as a bean. The surface of this portion feels granular, while in consistence it is hard and elastic. A thick cicatrix, parallel to the edge of the lid, is visible in the conjunctiva of the right lower eyelid, the external commissure, and the outer half of the lid. Everywhere else the conjunctiva is red, slightly thickened, and rather yielding. The upper eyelid cannot be everted ; its conjunctiva is in about the same state as that of the lower lid. A flabby fold, corresponding to the previous tumor, falls from the retrotarsal portion. The cornea is slightly hazy.

Left eye : Thick cicatrices are visible in the inner portion of the conjunctival sac near the plica and caruncle, but they do not hinder the motions of the eyeball. The conjunctiva and cornea are in the same condition as those of the right eye.

Microscopic conditions.—The various portions of the tumor were hardened in alcohol and tinted separately with an ammoniacal solution of carmine, and a solution of hematoxylin in alum. The reagents for the amyloid were the iodine solution of iodide of potassium, diluted sulphuric acid (*cf.* Böttcher : *Virchow's Archiv*, lxxii, page 510, *et seq.*), and subsequently methyl violet in iodine.

Specimens from the *left eye*. None of the reagents gave a decided amyloid reaction. The iodine and sulphuric acid treatment produced a bluish shimmer at one or two places. The methyl violet failed entirely.

Adenoid tissue was found in the whole thickness of the tumor,

after cutting through several layers of pavement epithelium, two or three layers of polyhedral cells, and a layer of cylindrical cells. The polyhedral cells, which were precisely like lymphoid cells, were thickly spread throughout a network of fine, stiff, pale fibres, in the nodal points of which numerous granules were visible.

The tissues in the deeper layers, as well as close beneath the epithelium, *refracted light in a marked degree*. The cells, as a whole, appeared more voluminous, but not so much so that the possible increase in size could have been mathematically demonstrated by accurate measurements. The body of the cell was less granular than usual; unmistakably homogeneous. The nuclei were distinctly paler and less highly developed than in the neighboring and unaltered districts. They were often rudimentary, and absent from many cells. Exuberant structures, which evidently originated from a coalescence of the metamorphosed cells above described, were occasionally visible. Vessels were infrequent, and their walls always intact. I saw a single artery with a peculiarly homogeneous media, glassy and remarkably broad. But no trace of any reaction could be discovered.

The deeper layers of the tumor were occupied by a loose, fibrous connective tissue with large meshes, interspersed with a few elastic fibres and numerous fat-cells. This was evidently subconjunctival tissue which had been pushed forward from the epithelium by the pathologically increased adenoid tissue. The vessels were rather coarse.

Right eye: The pieces taken from the tumor at the upper conjunctival fold gave an exquisite amyloid reaction. The potash-iodine solution alone gave an instantaneous dark greenish-blue reaction, while the addition of sulphuric acid gradually increased this tint to a more or less pure blue.

Several layers of stratified pavement epithelium which had been badly preserved, covered a narrow strip of fibrous connective tissue which contained a few cellular elements. Beneath this lay a confused mass of amyloid clumps and structures in the various shapes so well figured by Zwingmann. The tissues at this region had degenerated so excessively that their structure could no longer be made out.

The piece excised from the tumor at the lower conjunctival fold was of the same microscopic structure as the specimen from the left eye.¹

¹ This case is identical with the one described by Zwingmann: *l. c.*, p. 144.

CASE 29.—*Sept.* 3, 1880. M. T., æt. 32, a healthy peasant girl, has suffered from an affection of the eyes for one year and a half. She complains of increased sensibility, redness, and lachrymation of the left eye.

Right eye : Conjunctiva slightly injected ; no trace of trachoma.

Left eye : Slight ptosis, both lids voluminous and projecting. The bluish skin can be easily moved over the tarsus. The orbital edge of the upper tarsus feels thickened. The conjunctiva of the lower lid is deep-red, thickened, and succulent ; its surface smooth. The lower conjunctival fold is occupied by a grayish-yellow, soft, and elastic ridge 2 *mm.* thick and 3 *mm.* high, which extends from the hypertrophied plica to the external commissure. The upper lid is considerably stretched so that some force is needed to evert it. The tarsal conjunctiva is thickened and evenly red ; the surface uneven but not from granulations or lymph follicles. The subconjunctival tissue of the conjunctival fold is everywhere *considerably* thickened but elastic, the surface smooth and red. The upper portion of the cornea is slightly abraded. Soon after the patient's reception to the hospital, an ulcer formed in this region and extended rapidly downward.

Treatment.—Frequent instillation of atropia and energetic cauterization of the conjunctiva with the copper crayon. The ulcer soon healed, and the cauterizations seemed to act favorably upon the neoplasm, although it did not noticeably retrograde.

Microscopic examination of a piece of the ridge-like tumor revealed conditions similar to those already described in Case 28, although less marked.

CASE 30.—*Dec.* 17, 1880. A. K., æt. 21, a healthy peasant girl, has suffered with an affection of the eyes for three months. The disease began with a slight "inflammation" of both eyes and continued for eight days. The right eye then became well, while the left upper eyelid began to swell, so that in three or four weeks vision was very much interfered with. Various remedies proved of no avail.

Right eye : Conjunctiva everywhere injected and the upper fold thickened. A small granulation lies near the outer commissure.

Left eye : Total blepharoptosis. The upper lid projects enormously : horizontally, it measures 54 *mm.* ; vertically, 33 *mm.* It falls completely over the lower lid. The skin is tense, smooth, well marked with varicose veins ; all its folds have disappeared, while near the commissure it is quite brown and thickened. Pal-

pation discovers hard knotty masses like cartilage, which can be easily moved over the orbital margin. The upper lid cannot be everted. On pulling it out as far as possible from the eyeball, large round masses, evidently arising in part from the tarsal conjunctiva roll into sight. They are yellowish-red, rather translucent, elastic, and hard, with a smooth surface. The caruncle and plica semilunaris have degenerated in a similar manner. The lower lid is intact; the conjunctiva swollen but smooth. The cornea is normal.

The patient reported again, Jan. 17, 1881. The tumor of the left upper lid has increased considerably in size. The lid now measures horizontally, 65 mm.; vertically, 40 mm. The skin of the lid is brown over a much larger extent of surface than before.

Treatment: February, 15, 1881.—After slitting the left external commissure and everting the upper lid, the tumor was partially excised with the scalpel, great care being taken to spare the conjunctiva. When heaped together, the fragments were as large as a crab-apple. The hemorrhage was very slight. A light bandage with salicylic cotton was applied. The conjunctival sac was irrigated every hour on the following days with a 2-per-cent. solution of boracic acid. The case recovered in a fortnight without any reaction. The remaining masses gradually diminished in size until the day of the patient's discharge (February 28, 1881), but were still quite hard.

A hasty microscopic examination revealed the same general conditions as already described in Case 28 (left eye).

II.—*The clinical significance of the so-called amyloid tumors of the conjunctiva.*

The age of the thirty patients with amyloid tumors of the conjunctiva varied between 13 and 55 years: 8 cases between 10 and 20; 14 between 20 and 35; 8 over 35, *i.e.*: most of the tumors were observed between the ages of 20 to 35. Zwingmann (*l. c.* pag. 146) draws the same inference from fifteen cases only, and suggests that trachoma also appears about the same age. But we are to remember that the value of such a comparison must be slight from other grounds, to say nothing of its very weak numerical basis. For the age which the patients gave is not that at which the disease first became developed in their eyes, but their

age when they first consulted the oculist. Moreover, in such cases as these which are of a distinctly chronic nature and accompanied with symptoms of but slight significance, the patients hardly know how long the affection has lasted, so that the question of age is subject to many variations.

Of the 30 cases of amyloid tumor, 13 were observed in women, 17 in men.

The general condition of the patient was good in 16 of the 30 cases. In 8 others, various statements were made of anæmia, swelling of the lymphatic glands, and syphilis, but they do not seem to indicate any connection between the general condition and the local manifestation of the disease in the eye.

Amyloid tumor of the conjunctiva is an extremely chronic affection; it usually requires several years for development, and its growth is mostly slow. Of 24 cases, 12 lasted from 3 to 12 years; 6 from 1 to 2 years; 6 less than 1 year. These figures, however, are not wholly reliable, because they are based entirely upon the statements of the patients. Still, they will serve to show the chronicity of the disease. In point of fact, the eye is so much exposed to view, that pathological formations such as amyloid tumor upon this organ are usually noticed at an early date even by the laity.

The disease begins unnoticeably: the total absence of inflammatory symptoms must be emphasized. For this reason, no original cause of the disease can generally be ascertained.

The development of the affection is usually slow and gradual. But there are cases in which it is so rapid, that in the course of a few months, or even weeks, the tumor may reach the same size attained in other cases after a growth of many years. Thus, in my third case, the left upper lid measured 54 mm. horizontally and 33 mm. vertically*Dec. 17, 1880; by Jan. 17, 1881, the horizontal measurement had increased to 65 mm., the vertical to 40 mm.

Of the 30 cases so far reported, 21 were affected on one side only, 9 on both sides.

The so-called amyloid tumor of the conjunctiva is a disease of the conjunctiva of the eye. This tissue is the only one affected

in the preliminary stages of the disease. Invasion of the other portions of the lids—and this can happen to any of the tissues of which the eyelid is composed—may occur at a later stage.

The disease consists in a proliferation of the subconjunctival tissue. This process is most frequent and extensive at that portion of the conjunctival fold which lines the orbital edge of the tarsus, the plica semilunaris, and the caruncle. As the disease progresses, it principally affects the scleral conjunctiva. The tarsal conjunctiva is generally but slightly affected; not that it is so infrequently attacked (on the contrary it is often so), but that the proliferative condition is generally of a low grade. Still my third case shows that large tumors are met with in this region; or, as Zwingmann (*l. c.*, p. 175) has so felicitously expressed it: "The tumor almost always delights in spreading out into the looser, more movable, and elastic subconjunctival tissue, avoiding the dense tissue of the tarsus and the tarsal conjunctiva."

The frequency with which the various portions of the conjunctiva were affected in 27 cases (37 eyes) may thus be tabulated: the whole conjunctiva in 13 cases, the conjunctiva fornix in 1 case, the scleral conjunctiva in 4 cases, the tarsal conjunctiva in 1 case.

The plica and caruncle were never affected alone.

Simultaneously with other portions of the conjunctiva, the conjunctiva fornix was affected in 32 eyes, the scleral conjunctiva in 18, the tarsal conjunctiva in 30, the plica and caruncle in 20.

In every case but two, the tarsal conjunctiva (especially that portion which covers the orbital edge of the tarsus) and the conjunctiva fornix were the seat of the disease.

*The prevalent locality of amyloid tumors of the conjunctiva is the upper fold, and neighboring portions of the tarsal conjunctiva, as already stated by Zwingmann (*l. c.*, p. 174). And it is just these portions of the conjunctiva in which the normal subconjunctival tissue bears "the greatest resemblance to typical adenoid tissue." (Compare Waldeyer, Graefes-Saemisch, Bd i, p. 249.)*

The proliferation at this region is usually diffuse; it is not sharply defined against the neighboring tissues; it is not circumscribed. Only two cases of circumscribed tumors have been reported: one of the scleral conjunctiva, the other of the tarsal conjunctiva.

The epithelial layer of the conjunctiva is firmly united with the tissue of the tumor. One case only has been reported "of a tumor in the lower conjunctival fold which was covered by normal conjunctiva."

Stroehmberg (*l. c.*, p. 16) has given so good a description of the peculiarities of this variety of tumor, that I quote from it, as follows: "This tumor cannot be identified with any previously known surgical tumors. It might soonest be confounded with trachoma, and yet it differs essentially from the proliferative form of that affection. It does not consist, like trachoma, of various granules, nor of a conglomeration of granules. On the contrary, it is diffuse; and if by chance it looks ragged or granular, the lobes are irregular in shape, and do not bear the least resemblance to a clump of structures all heaped up together, any one of which might be taken as a type of the whole. These roundish lobes seem to originate from folds of the conjunctiva, which in turn owe their origin to the fact that, although the conjunctiva undergoes proliferation not only in thickness but along its surface, it has to be satisfied with the space created for its normal expansion between the eyeball and lids. It is these single lobes which occasionally give a granular appearance to the whole tumor, but this is nothing more than a reproduction *in petto* of the appearance of the tumor in the conjunctival fold. These lobes also are not alone due to proliferation in the subconjunctival tissue, but to an increase in the surface of the conjunctiva, which at the fold, rather than anywhere else, finds a chance to enlarge."

There are four phases in the development of amyloid tumors of the conjunctiva, from their earliest stage to the most advanced form of degeneration.

1. *Simple adenoid proliferation in the subconjunctival tissue.*
2. *Hyaline degeneration.* (Raehlmann: these ARCHIVES, vol. x, page 178.)
3. *Exquisite amyloid degeneration.*

4. *Calcification and ossification.*

The first phase is represented in four cases, in one of which both eyes were affected, in the others only one eye.

The external appearance of the eyes in these four cases is normal, with the exception of a slight increase in the size of the eyelids in that part which adjoins the orbital margin, and moderate ptosis.

The tension of the eyelids in two cases is considerable, so that a certain degree of force is necessary for complete eversion.

Definite inflammatory alterations are absent in all. One has a slight keratitis, another is complicated with luxuriant trachoma in the first stage. But we are to notice that it is only on that portion of the conjunctiva unoccupied by the neoplasm that the luxuriant granulations rest. The surface of the tumor is absolutely free from granulations.

The distinctive process in these four cases is a proliferation in the subconjunctival tissue, especially in the fold, and secondarily in the orbital margin of the tarsus and the plica. The increase of volume is indicated in three cases by a simple thickening of the parts affected, in the fourth by a more tumor-like character.

The surface of the neoplasm is generally smooth, and covered with a healthy mucous membrane. The occasional folds are due to the conditions of the space in which the neoplasm grows. Stroehmberg's explanation of their origin seems very plausible. When the tumor lies in the submucous tissue of the tarsal conjunctiva, its surface is knobby and sometimes granular. For the neoplasm cannot grow so luxuriantly in the dense tissue of this region as in the coarse-meshed, lax subconjunctival tissue of the folds. Hence only small clumps are formed, and these give rise to the knobby, granular appearance.

If the neoplasm is poorly supplied with vessels, it is generally of a bright yellow, glassy color, and of a coarse but very elastic consistency; but if highly vascular, its color varies from an indescribably diaphanous reddish-yellow to a reddish-brown, with a delicate elastic consistency.

During the first phase of the development of amyloid tumor the patients complain simply of heaviness of the lids, increased sensibility of the eye to various influences, slight congestion of the eyes, and exceedingly disagreeable sensations after exposure to dust, heat, bright light, cold air, etc.

The anatomico-pathological character of this first phase consists in a proliferation of pure adenoid tissue in the sub-mucous layer of the conjunctiva, or, in other words, hypertrophy of the normal adenoid tissue of this region. In these four cases, however, the tissue is no longer unaltered. The so-called hyaline degeneration has already begun.

In the subsequent phases, the proliferation assumes greater dimensions; the tumor is occasionally described as being as large as an almond.

The larger the tumor, the more remarkable and characteristic the external appearance of the eyes affected. In general we distinguish two types according as the growth originates in the scleral conjunctiva, plica, and caruncle, or in the conjunctival fold and upper margin of the tarsus.

If the scleral conjunctiva is chiefly or solely affected, the tumor encircles the cornea like a ring, more or less complete, more or less high. In the centre of this ring lies the cornea. If the tumor is small, the cornea is entirely uncovered; if large, its lobes fall over the cornea and conceal it more or less; occasionally the cornea cannot even be seen.

The lids are pushed away more or less from the eyeball, depending upon the greater or less thickness of the tumor. If the scleral conjunctiva in the region of the fissure of the lids is greatly thickened, it is difficult and sometimes impossible for the patient to close his eyes.

Large tumors, situated at the conjunctival fold, and the adjoining tarsal conjunctiva cause a characteristic protuberance of the corresponding lid. It sometimes bulges forward like a bag. When the tumor is large, the whole lid may be bulged forward, but more extensively over the region of the conjunctival fold. From here the curvature either decreases gradually—as is the case when the tarsal conjunctiva has degenerated into larger tumors—or steeply, when the tarsal conjunctiva is but slightly affected, to the edge of the lid.

In the former case, the position of the edge of the lid is scarcely changed, it merely falls away slightly from the eyeball; in the latter, the lid is more or less inverted, or even in a state of entropion.

When the tumor is circumscribed, the lid is prominent only over the seat of the tumor.

If both lids are equally affected, the eye looks like a hemisphere with a narrow horizontal slit.

If the upper lid alone is affected, and if the tarsal conjunctiva has also undergone proliferation, the lid is enlarged from above downward, falls down, and even projects over the lower lid.

The skin of the lids is generally intact, easily movable, and can be pinched up into folds. Enlarged veins are frequently visible upon the upper lid, which is occasionally of a brownish color over a small extent of surface. The skin of the lids is very rarely œdematous, even to a slight amount.

The edges of the lid are sometimes reddened and excoriated near the external commissure by the serous secretion, which flows scantily from the affected eye and dries into crusts.

The skin of the eyelids was never found connected with the neoplasm. But in one or two cases the skin at the angle of the eyelid was thus slightly united.

On palpation of the eyelids we can feel knobby masses, with a smooth, or, perhaps, uneven surface, sometimes hard, like cartilage, sometimes quite yielding. These masses cannot be moved from the tarsus, but they can be from the orbital margin. It is oftentimes difficult to evert the lids on account of their enormous tension, unless we use a great deal of force, and even then it is sometimes impossible, unless we slit the external commissure freely. It is generally easy to evert the lower lid, and occasionally, though rarely, the lid is everted by the tumor itself.

After slitting the commissure, which is indispensable for a perfect operation, the tumor generally slips out from the conjunctival fold. It is rarely a *single* solid growth, but generally a convolution of irregular tumors running parallel

to the edge of the lid, with their base in the fold, or tarsal or scleral conjunctiva. The lobes sometimes extend to the degenerated plica or caruncle.

When the whole conjunctiva is affected by the disease, the tumor fills the entire space bounded by the eyelids in front and the eyeball behind; and jutting forward from between the eyelids it presents a picture which is totally unlike that of any other affection of the conjunctiva, a picture indescribable and unique.

And here we must remark that eyes thus solely affected are never inflamed. Inflammatory symptoms are noticed only when the cornea becomes secondarily affected.

These symptoms are equally characteristic of the other three phases of amyloid tumors. The variations in the separate phases shall next be considered.

The *second* phase (hyaline degeneration) is characterized by the *smooth and glistening surface of the tumor*. (Exceptionally, however, the tumor projects beyond the lids, in which case the mucous membrane becomes dry and rough.) *When slightly vascular, the tumor is generally brownish-yellow and wax-like; with numerous vessels, unmistakably diaphanous. The surface of the tumor is sometimes marked by a few coarse blood-vessels. The greater the vascularity of the tumor the less its consistence; this is, however, always elastic. The tumor is never soft in this stage.*

Tumors in this phase are harder than those in the first phase, and more elastic than those in the third.

The pathologico-anatomical condition in this phase is characterized by advancing proliferation of adenoid tissue and hyaline degeneration (Raehlmann, *l. c.*, and Case 28; microscopic condition).

The *third* phase is characterized by a few but important symptoms. The color of the tumor remains about the same, except in case of excessive vascularization, when it becomes a dirty brownish-red. The tumor generally looks diaphanous and glassy. *It varies in consistency from hard to gelatinous, depending on the degree of vascularization. But even in the latter condition, the tissue is not elastic; if comparatively hard it is inelastic and brittle; if soft, inelastic, but impressible.*

The tissues are generally so fragile that in attempting to remove the tumor by seizing it with the forceps, or even in eversion of the lids, it rips and tears into shreds in every direction, and shows smooth edges and glazed surfaces, with here and there a drop of dark blood. Occasionally some pieces break off if we manipulate the tumor too freely.

The tissues sometimes pit upon pressure with the finger.

This phase is occasionally characterized by spontaneous hemorrhage, which owes its origin to the fragility of the vascular walls.

The chief pathologico-anatomical condition is the exquisite amyloid degeneration, which has been so carefully described by Raehlmann (*l. c.*).

The *fourth* phase is characterized by calcification and ossification, in addition to pronounced amyloid degeneration as in the previous phase. In two cases, we read that a mass of chalk, in one, that a bit of bone was found imbedded in the interior of the tumor. Hippel (*l. c.*, page 16) thus describes a case of his own: "Several sections of the mucous membrane of both the upper and the lower lid contained, partly near the surface and partly in the deeper layers of the conjunctiva, some small hard, round, and irregular bodies, which, even to the naked eye, were quite distinctly set off by their bright color from the surrounding wine-colored tissue. The microscope showed that they were composed partly of chalk and partly of genuine bone with beautifully developed osseous corpuscles and Haversian canals."

When the calcified or ossified portions lie deep in the tumor, they naturally escape simple inspection or even palpation, as happened in one case, when the metamorphosed districts were not discovered until the microscope was employed. But when they lie directly beneath the conjunctiva, their presence is readily revealed by their appearance and hardness.

We have not yet sufficient material at hand to define the precise manner in which these four different phases are developed. Still it is quite plain that no particular time is needed for the development of each especial phase. Thus,

the development of the third phase is evidently independent of the age of the tumor, for in one case amyloid degeneration was noticed when the tumor was a year and a half old, and in another case when the tumor was only five weeks old. On the contrary, in one case in which the tumors had existed on both eyes for at least twelve years, the left eye showed only the faintest traces of amyloid degeneration, while in the right eye it was well marked although circumscribed.

There is one symptom which has not yet been mentioned—proliferation of the tarsus, as apparently demonstrated by its enlarged dimensions in all directions. This condition seems so evident and undeniable from mere external appearances, that Adamük speaks as a matter of course of “amyloid degeneration of the conjunctiva and of the tarsus.”

But an anatomical examination of those cases in which the tarsus seemed to be excessively thickened *showed that the tarsus was either entirely intact, “or only secondarily and even then but slightly affected with amyloid degeneration, never independently proliferated.”* Still the deception is so perfect that it is quite impossible in this way to decide whether the tarsus is affected or not, because we cannot by the touch distinguish the tarsal cartilage from the proliferations in the submucous tissue of the conjunctival fold and tarsal conjunctiva.

Amyloid tumors in the second and following phases cause various disturbances on the part of the eye in addition to those already mentioned under the first phase. These are chiefly of a mechanical nature, and, in a word, are due to the pressure which an extensive tumor in this region must of course exercise upon all the neighboring structures.

Amongst these disturbances we include :

1. The deformity already described.
2. The interference with the mobility of the lids. Sometimes the upper lid cannot even be raised. Ptosis of various degrees is often met with, as well as total blepharoptosis.
3. It is probable that the eyeball itself cannot easily be rotated, although no such disturbance has yet been reported.
4. Secondary affections of the cornea (10 times in 30 cases):

Pannus in 6 cases, always accompanied with trachoma ; loss of substance in 4 cases.

These latter facts would seem to indicate that the tumor does not generally exercise an injurious effect upon the cornea, probably owing to the fact that it is only the smooth mucous membrane of the tumor which ever comes into contact with this tissue.

5. When the tumor embraces the locality of the puncta lachrymalia, the latter are more or less everted. I have never seen or heard of any interference on the part of these tumors with the lachrymal secretions.

6. Diminution of vision may arise from the blepharoptosis, or from the tumor covering the cornea, or from the secondary affections of the cornea.

We now reach the important question of the relation of amyloid tumor of the conjunctiva to trachoma,—a question upon which authors are greatly divided.

Oettingen (*l. c.*, p. 56) thinks that trachoma is the starting-point of the disease, and that amyloid degeneration is one of the forms of retrogressive metamorphosis of trachoma. As we sometimes see fatty degeneration of trachoma, why should we not, under certain circumstances, meet with an amyloid degeneration? The so-called "gelatinous degeneration" of trachoma may be nothing but the preliminary stage of amyloid degeneration. "Here," says he, "it would be easiest to prove how the follicles coalesce into swollen masses, and gradually condense into those brittle and fragile flakes which are peculiar to amyloid degeneration."

Saemisch, Leber, Becker, Mooren, and Stroehmberg consider that the disease is entirely different from trachoma. Narkiewicz-Jodko thinks that the tumor is by no means exclusively observed on granular and degenerated conjunctivæ. He acknowledges, however, that it is frequently observed under such conditions.

In his second publication (*l. c.*, p. 316) Leber expresses the view that "the amyloid degeneration of the skin of the eyelids is simply a local disease, and in many cases a sequel of trachoma." After defining the variations between trachoma and the disease in question, he agrees with Mooren that the latter is *sui generis* and entirely different from trachoma.

Hippel (*l. c.*, p. 22) cannot decide whether there is any direct connection between granular conjunctivitis and amyloid degeneration of the conjunctiva. He thinks that his own case, however, represents a more advanced though rare stage of trachomatous development.

Zwingmann (*l. c.*, p. 155), who was the first to employ the expression "amyloid tumor" for the "amyloid degeneration of the conjunctiva" of the older authors, thinks that it is always due to the degeneration of a more or less circumscribed or diffuse granuloma, and that these granulomata in a majority of cases are simply trachomatous proliferations probably arising from incipient amyloid degeneration of the original trachoma.

Adamük (*l. c.*, p. 8) cannot decide what relations exist between these two "processes."

Raehlmann (*l. c.*, p. 188) is of the opinion that these amyloid tumors are specific neoplasms, independent of trachoma in their origin and course, and that they may attain very large dimensions, and undergo extensive or total hyaline degeneration without revealing a trace of amyloid degeneration.

Of 30 cases of amyloid tumor, 14 were entirely free from trachoma, while in 16, trachoma or allied affections were undoubtedly present. In other words, almost one half of the cases showed no signs of trachomatous alterations.

This fact, in conjunction with the characteristic picture of this disease in all its phases, proves that amyloid tumor of the conjunctiva is a disease sui generis, originating from hitherto unknown causes in a previously healthy conjunctiva, and having nothing in common with trachoma.

Leber's plausible idea (*l. c.*) that the uncomplicated cases may possibly be "especial forms of trachoma," or "a degenerated trachoma from the beginning," seems unsupported by clinical testimony.

Amongst the 16 cases associated with trachomatous alterations in the conjunctiva, we find 1 of numerous lymph follicles, 2 of a few granulations, 8 of luxuriant granulations, 1 of extremely diffuse trachoma, 2 of trachoma in the shrivelled stage, 2 of trachoma in the cicatricial stage.

In all of these cases but one, the trachomatous alterations occupied a portion of the conjunctiva entirely unaffected by amyloid growths, and in no case was granular degeneration visible upon the mucous membrane of the amyloid tumor.

Leber and Zwingmann (*l. c.*) have asserted that amyloid tumor of the conjunctiva is in many cases the direct result of trachoma in an advanced stage of development. But no one has ever observed such a transformation. The only parallel case is the simultaneous appearance of both processes on one and the same conjunctiva,—which really proves nothing. Moreover, only one case of this sort has ever been observed. In most cases, the trachoma was of the common type. In two cases, the diagnosis of trachoma simplex might even have been flatly denied. We have no right to call a conjunctiva trachomatous, when its surface is simply strewn over with a few structures resembling granulations!

All of these observations, therefore, go to prove that the juxtaposition of the two processes is simply accidental,—a probability which is rendered almost certain by the frequent appearance and development of amyloid tumor of the conjunctiva independent of trachoma.

When the tumor is large, well developed, and in its latter phases, the diagnosis is made without difficulty. All mistakes can be easily avoided when we remember that the disease has a specific character differing from all other affections of the conjunctiva.

But the incipient stage is difficult to diagnosticate. Mistakes will be most frequent in the case of diffuse trachoma, especially when the latter is complicated with "thick duplicatures in the hypertrophic conjunctival fold," of which Ammon and Stellwag (*Lehrbuch*, 4te Aufl., page 453), have spoken. I am quite unable to lay down the differential points for the diagnosis of amyloid tumors, because it seems quite probable that many cases of apparent diffuse trachoma simply represent the preliminary or even advanced stages of the tumor eventually combined with trachoma. In order to differentiate these two conditions, we should remember that, on the one hand, in diffuse trachoma granula-

tions predominate, and further, that we should probably meet with inflammatory symptoms as well as pannous keratitis. On the other hand, the absence of pronounced granulations, as well as inflammatory symptoms and pannous keratitis, would suggest the presence of incipient amyloid tumor.

The most difficult cases to diagnosticate will be those in which a tumor of small dimensions is associated with luxuriant trachoma. Under such circumstances, as well as in all other doubtful cases, we shall have to resort to a microscopic examination.

The villous, cauliflower-like proliferations of the mucous membrane, which are occasionally noticed in cases of chronic blennorrhœa of the conjunctiva, will hardly give rise to errors in diagnosis. They differ too much in their structure and in the nature of their surfaces from the amyloid tumor, covered as the latter is with a smooth and glistening mucous membrane. Beyond this, the nature of the disease in cases of blennorrhœa, the inflammatory symptoms, and the typical secretion will verify the diagnosis.

Other conjunctival tumors can be differentiated from amyloid tumors by the following diagnostic points:

Polypi, according to Saemisch, are delicate, pale-red structures shaped like a pear, and provided with a thin pedicle.

Lipomata are usually situated between the external and superior recti muscles. They are soft, pure yellow, and seem composed of several lobes.

Epitheliomata are almost invariably secondary growths. Exceptional cases are extremely rare.

Sarcomata usually arise from the sclero-corneal margin; rarely from the conjunctiva itself. They are generally pedicled, very vascular, and pigmented.

The cases of amyloid tumor of the conjunctiva, so far collated, are too few for us to set up any rules for establishing the prognosis of the disease. On the whole, however, we cannot embrace Zwingmann's unfavorable opinion, especially as regards relapses. Even when the tumor has attained an extensive growth, it is accessible to therapeutical and still

more so to operative measures, and should a radical removal, which Zwingmann regards as indispensable, be impossible, the prognosis is not quite unfavorable. For, in many such cases, the disturbances and annoyances caused by the tumor have been greatly relieved and sometimes completely removed.

The eyeball itself is only rarely, and even then but slightly, affected, so that no especial danger need be feared from that quarter.

No cases have yet been reported in which the tumor has been allowed to grow as it pleased. We cannot, therefore, tell what would be the ultimate result under such circumstances.

Various caustics as well as the knife or scissors have been resorted to in cases of amyloid tumor of the conjunctiva. The copper crayon was used in two cases with moderately successful results; a solution of copper in a third case, and of silver nitrate in a fourth. It would seem hopeless to attempt to remove large tumors in this manner. Perhaps it might prove successful in the incipient stages.

We may here suggest that no one has yet tried to diminish the size of the tumor by parenchymatous injections of tinct. iodinii or tinct. Fowlerii.

Twenty-five of the 30 cases were operated upon. The growth was radically removed in 9 cases, in most of which the tumor was small and more or less circumscribed. A radical removal of larger growths was also attempted in 4 cases. Partial excision was attempted in 15 cases; one case was operated upon at several sessions.

In performing the operation, the tumor, if small, should be exposed as freely as possible by everting the lids; if large, the external canthus must be divided. The excision is to be performed with the scalpel or scissors, whichever appears to be the more suitable in any given case. The sharp spoon has occasionally proved available in removing gelatinous tissue which escaped the bite of the forceps. In 4 cases the operation was performed through the lid; twice in order to give the lid a more suitable form by removing a piece of skin. The hemorrhage was generally

considerable, especially when the amyloid degeneration was well marked. But it was easily stopped. In 2 cases Paquelin's thermo-cautery was used for this purpose.

The after-treatment consisted in the application of a more or less firm bandage, usually with antiseptic materials. The conjunctival sac was cleansed with disinfecting solutions of carbolic or boracic acid.

The recovery was generally brief; in a few days with but slight reaction. It was quite remarkable to notice the regenerative capacity of the conjunctiva. Large losses of substance, which would be of the most grievous consequences to the healthy eye, were rapidly made up in these cases, and the resulting cicatrices rarely showed how extensive the defects had been.

Erysipelas and abscess of the lids were noticed in 2 or 3 cases.

Ulceration of the cornea was also observed in 5 cases, after operative removal of the tumor.

In 9 cases of more or less radical extirpation, the result was satisfactory, so far as concerned the removal of the tumor and the disturbances which it caused. Subsequent operations for ptosis, entropium, etc., had to be performed in several cases to restore the eyelids to a normal position. Two relapses were noticed in one case, necessitating repetitions of the operation.

In one case the tumor was successfully removed, but a total ankylo-symblepharon rendered the eye useless.

In 7 of the 15 cases in which the tumor was partially excised, the remaining portions underwent retrogressive metamorphosis in a shorter or longer time after the operation, and after complete cicatrization of the portion which had been excised. The cause of this process has not yet been discovered. The disappearance of the remaining portions was, however, very gradual.

In two cases, on the contrary, the tumor sprouted so rapidly after partial excision, that Zwingmann (*l. c.*, page 176) thought that the operation itself must have been at fault. He therefore advises us to remove at an early stage and in the most thorough manner every particle of tissue which seems morbid to the touch.

It is impossible at present to explain why relapses occur when the amyloid growths have already undergone retrogressive metamorphosis after partial extirpation. It seems to me that the further the tumor has advanced into the third phase of development, and the more exquisite the amyloid degeneration, so much the more frequently are we to expect relapses after partial extirpation.

The treatment of amyloid tumors of the conjunctiva should be as follows:

1. Radical extirpation in all those cases in which it can be accomplished without especial difficulties, *i. e.*, in which the tumors are small, more or less circumscribed, and in which the operation can be performed without too extensive a loss of substance.

2. Partial extirpation in all other cases, in the hope of exciting spontaneous retrogressive metamorphosis. If this process does not set in, if relapses occur, *partial extirpation at several subsequent sessions is to be attempted* (Mandelstamm), in order to prevent symblepharon or ankyloblepharon.

If the position of the lids remains anomalous, suitable operations may be undertaken at a later date.

The chief point in the after-treatment is to cleanse the conjunctival sac frequently and thoroughly with disinfectants, especially a 2 % solution of boracic acid, which is well borne and *does not irritate*. We have used this solution for the last two years, with most excellent results after such operations.

There is no need of a subsequent compressive bandage, as it may hinder the escape of secretions from the conjunctival sac. A light occlusive bandage, with antiseptics, is quite sufficient.

Corneal complications are of course to be treated according to special indications.

CONTRIBUTIONS TO THE PATHOLOGY OF SYMPATHETIC EYE DISEASE.

BY DR. FEDOR KRAUSE,
ASSISTANT TO PROFESSOR HIRSCHBERG'S CLINIC.

(With a plate, Tab. viii.—from Vol. X., German edition.)

Translated by WILLIAM C. AYRES, M.D., N. Y.

UNDER the auspices of Dr. C. Friedländer, demonstrator at the City Hospital, I have made the following microscopic examination of a severe case of sympathetic iridocyclitis. The case was presented to the Berlin Medical Association by Prof. Hirschberg, with the following remarks :

Emilie S., 21 years old, a servant girl, came to the clinic on August 19, 1880. She was perfectly healthy; had received an injury to her left eye nine weeks before. She was cut in the eye by a large piece of a broken lamp chimney; the whole cornea was split from above downward; above, the cut extended into the sclera. The iris was prolapsed throughout the whole extent of the wound. The aqueous, lens, and a part of the vitreous were evacuated, and the eyeball collapsed. In the hospital she was treated with compressive bandages. There was a prolapse of iris in the upper angle of the wound, which was removed a few days after. Healing took place without any irritation, and the eye retained perception of light. After three weeks she was discharged, and unfortunately went back to her position as a servant girl.

Eight days later the right eye began to be inflamed. On July 15, or thirty-two days after the injury, sympathetic iritis was diagnosed in the right eye. The patient was put in a dark room; atropine and mercurial inunctions were ordered.

Unfortunately she was sent home to her family, but returned on August 10th with a relapse, exhibiting a punctated opacity of the posterior part of the cornea, and numerous posterior synechiæ; almost complete blindness (fingers hardly counted). At this stage her physician proposed enucleation of the injured eye, but she did not consent, and came to Berlin.

St. pr., August 19th.—There is a cicatrix throughout the breadth of the cornea of the left eye, extending into the ciliary region of the sclera. Iris united to the scar. No anterior chamber. The pupil is very narrow, with a gray connective-tissue mass closing it. Slight pericorneal injection, especially above, in the form of a triangle. Several large scleral vessels extending to the scar, both above and below. $S = 0$; $-T\frac{1}{2}$. Pain on pressure in the ciliary region upward and inward, but not excessive. The patient is somewhat indolent.

In the right eye circumcorneal injection. Cornea covered with small punctate opacities. In spite of atropine the pupil is not dilated; pupillary margin adherent to lens capsule and irregular. The tissue of the iris elevated in numerous places. Pupil can not be illuminated. Fingers barely distinguished at 1' eccentrically. $-T\frac{1}{2}-1$.

On August 20, 1880, the wounded eye was removed under narcosis. She was placed in a dark room, atropine was instilled, and inunctions were energetically employed. August 21st the circumcorneal injection was somewhat diminished, and the pupil slightly illuminable. Said she saw better, but an examination was not made. September 13th: fingers 6'; with $+6D$ Sn $7\frac{1}{2}$; field moderately clear. Colored squares of 2 *cm.* were not distinguished at 12". The inflammation had subsided; iris in proper position; pupil illuminated slightly, so that cyclitic flakes could be distinguished in the anterior portions of the vitreous. She now lost patience and went home, but returned on October 21st much worse. She then had slight circumcorneal injection; cornea clear, iris green, pupil not dilated to medium size, with a gray band of connective tissue in it; slight illumination. Fingers at 6". F much narrower:—above, inward, and below 30° , outward 50° . Dark room, instillation of atropine, and thorough inunctions. December 2d, counted fingers badly at $1\frac{1}{2}$ '; with $+6D$ read not quite Sn 16. F slightly contracted. She was treated for six weeks and discharged December 2d, but told to stay in a dark room at home and to take iodide of potassium.

February 15, 1881, she returned in a much better condition, which had continued through four weeks previous. Eye free from irritation. Tension almost normal, pupil 3-4 *mm.* large, but slightly irregular. Iris attached to capsule by delicate bands of tissue. Surface of iris free, and of its natural color. Cornea, lens, and vitreous clear, with but few flakes in the last, which were situated near the papilla, partially covering it. In the periphery there were numerous white plaques round and well defined. Counted fingers at 6'; with + 6D read Sn 16. Field and color field normal for blue and red. Green called white.

May 11, 1881, she returned. Counted fingers at 8', recognized Sn 10 at 5'. With + 6D, Sn 7½.

The field was normal for white, blue, and red, but green was mistaken for gray. As long as she was out of the clinic, she took about 0.50 of iodide of potas. three times daily without any unpleasant symptoms.

May 11, the eye free from irritation, iris in position, pupillary margin attached to the capsule by a gray circular band of connective tissue. Pupil 4 *mm.* broad, 5 *mm.* high. Normal red reflex with the ophthalmoscope, and but few floating opacities in the vitreous. Papilla easily recognizable, but toward the temple was an opacity about the size of the papilla covering it partially. A smaller similar opacity covers the macula lutea. In the periphery are numerous little patches, mostly smaller than ⅓ P.

Anatomical Examination.—The eye was placed in Müller's fluid for 2½ months, and then cut open in its horizontal diameter. It measured 23 *mm.* in length and 25 *mm.* on the diagonal (see fig. 1, table viii). The broad scar pulled the middle of the cornea inward. The lens was absent. The vitreous, a portion of which had been lost, was shrunk to a flat mass, situated just behind the iris. The vitreous chamber was filled with a yellowish fluid mass. The whole *uveal tract* showed evident signs of inflammation. The *choroid* was everywhere very thick, in many places thicker than the sclera. The thickest part—2 *mm.*—was in the vicinity of the papilla. The thickened iris was applied to the cornea, and the ciliary body drawn in almost to the axis of the eye. As I detached the choroid from the sclera on both sides in order to find the ciliary nerves, there were places of adhesions between these two coats. The retina was folded.

This was caused by a fluid exudation which separated the retina and choroid at different places. The optic nerve, its sheaths, and the sclerotic looked healthy.

Microscopic Examination.—The sclera was normal, except in its inner layers where there was a slight infiltration. Conjunctiva somewhat more vascular than usual. The cornea was changed only in the region of the scar (fig. 2, table viii). Here the fibres were bent from their course, and slightly wavy, most pronounced in the posterior lamellæ. In the anterior the fibres were almost normal. The line of demarcation between the corneal tissue and the new-formed scar was well defined. In the vicinity of the scar, the corneal tissue showed a proliferation of nuclei and slight vascularization. The membrane of Descemet was detached, and the space between it and the cornea filled with new-formed tissue. At the cut end this membrane was rolled over on itself. The membrane of Bowman was tense, and near the corneal scar was somewhat raised, as was also the corneal tissue. The anterior epithelium covered the scar, but was not regular, the cylindrical layer being wanting.

The corneal scar showed different conditions in the different sections. In those which were made near the middle of the cornea, it united the ends of the divided corneal fibres in the anterior half. In the posterior half there was only a small border of this tissue along the corneal fibres. This border enclosed a prolongation from the iris, which on its posterior end was attached to the capsule. The further the sections passed from the middle of the cornea, the smaller the mass of connective tissue which united the ends of the corneal fibres, and the larger the portion of enclosed iris tissue. In the same manner the lens capsule gradually disappeared from the wound below, and where it was no longer to be found, the defect in the cornea was closed only by iris tissue. Small epithelial tracts sank into the scar tissue from the corneal epithelium. In this place I will mention a small space in the ciliary region, which appeared only in a few sections and was filled by an epithelial new formation (9, fig. 2, tab. viii). It measured 0.1 mm. in diameter, and was lined by tall cylindrical cells. This formation suggests the

genesis of cysts of the iris. In this case it has evidently been formed by cells which had been carried into the eye by the injury; the proliferated cells produced a kind of cyst.

The new-formed connective tissue of the scar contains numerous nuclei and blood-vessels. The fibres, which were already distinctly to be seen, stood perpendicular to the direction of the lamellæ of the cornea in the middle, but anteriorly and posteriorly they bent around so as to run parallel with these lamellæ.

On the posterior surface of the cornea there was a mass the shape of a plano-convex lens, in which the tissue of the iris and ciliary body was embedded (7, fig. 2, tab. viii). It was attached to the cornea by the scar tissue, so that during life there could not have been the smallest space of anterior chamber. All the bends and folds of the posterior surface of the cornea closely corresponded to those of the surface of the iris. The lens capsule was embedded in the midst of the tumor containing the iris and ciliary body (8, fig. 2, tab. viii); numerous round cells were between the folds of the capsule. The capsular tissue was well preserved, and also here and there remains of the lens tissue were to be seen.

The uveal tract showed the most numerous and interesting changes. As already observed, the iris could not be distinguished from the ciliary body, both having been fused into one mass; I will call this mass the anterior part of the uveal tract. Those preparations which were obtained from near the long diameter of the eye cut the lens capsule almost into two equal parts; it was attached to the cornea in front, and from thence passed backward, bending toward the side. The lens capsule did not form the boundary of the vitreous, but left this office to a band of connective tissue extending from the ciliary processes (9, fig. 2, tab. viii). This last tissue was distinctly fibrous and contained numerous nuclei. The thickened ciliary processes were still to be distinguished by a contour formed from their pigment. The pigment had collected into masses which could be seen with the naked eye, and with the loupe we could distinguish numerous small irregular nests of pigment infiltration.

With higher powers it was shown that the pigment was sometimes contained in cells, sometimes was free in the tissue. In places where we could see no pigment with small powers, with high ones the whole tissue was studded with the finest pigment granules. The tissue was composed, for the most part, of round cells; in the most pigmented places only such cells were to be seen. In other places where there was not so much pigment, the tissue was striated, and here we could find spindle-shaped cells lying close to one another in bundles. These bundles were infiltrated with round cells, which separated them from one another.

The ciliary body was tolerably normal. Its muscle fibres were apparently well preserved. They were packed together in groups by a round-cell infiltration.

In sections nearer the corneal margin, this connective-tissue boundary of the vitreous was not found. In this locality the medial and lateral parts of the ciliary body were separated; the pigment, which allowed us to follow the windings of the ciliary processes, passed continually from one side to the other.

In the thick choroid no dividing line could be seen between the two outer layers. The pigment layer was everywhere easily distinguished; in many places it was separated from the lamina elastica by a thin layer of amorphous exudation. Where the lam. elast. was easily to be seen, it was uneven and slightly wavy.

Sections of the choroid colored with hæmatoxyline or carmine, when examined with a hand-glass, had a peculiar dappled appearance (fig. 3, tab. viii). As a general rule, the whole choroid was colored, but sometimes we found small round places or long figures which were but little tinted. With high powers (see fig. 5) the deep-colored parts were composed only of round cells, whose nuclei had imbibed much of the coloring material. In the lighter parts there was a peculiar kind of cells, which could easily be distinguished from the round cells in that their nuclei were oblong and puffy, besides containing nucleoli. The nucleoli were all colored very deep, while the nuclei were not so much so in

the same length of time in which the nuclei of the round cells were colored to a dark shade. The protoplasm was colored very dark with eosine. The cells looked like *epithelial cells*; had sometimes only one nucleus, but most frequently two. They were further to be distinguished from the round cells in that they contained a larger quantity of granular protoplasm. The epithelial cells were from 2-4 times as large as the pus corpuscles, whose diameter was 0.006 to 0.008 *mm.* Some of these peculiar cells were much larger than those which we have described, and contained nuclei, varying in number until they formed true giant cells. Some of these latter were 0.020-0.057 *mm.* in diameter, the number of nuclei reaching as high as 28. The nuclei were, for the most part, situated at the periphery of the protoplasm. There was never any grouping of the round cells into a definite relation with the giant cells, as we find in true tubercles. The giant cells and also the epitheloid cells were sometimes isolated, sometimes several together, and often so close to each other that there was but little intercellular substance between them. The giant cells were not found to be more numerous in any particular layer of the choroid, as in the recent Manfredi case.¹

Both these kinds of cells were present in the tissue of the ciliary body and iris. In these last tissues they were often pigmented, whereas they were but seldom so in the choroid.

The *ciliary nerves* (fig. 4, *a* and *b*) were made the object of a special examination. They were isolated on the outer side of the choroid as far as possible with the naked eye and by the aid of magnifying glasses, and examined in longitudinal and cross sections as well as in teased preparations. The sections were made by using a minimum of glycerine paste and cutting them between pieces of amyloid liver. The axis cylinders were colored by letting the sections remain for a few minutes in chloride of palladium and carmine, or in carmine alone. In the latter case they remained in the solution 4-5 days. The nuclei were colored with hematoxyline or gentiana violet. For com-

¹ *Archives d' Ophth.*, Nov.-Dec., 1880, p. 44.

parison I prepared normal nerves under the same conditions.

In the longitudinal sections and teased preparations we could see with small powers that there were round cells within the nerve bundle. The number of these round cells varied in different localities, but were never very numerous. That they were really in the tissue of the nerve, and not merely appeared so, was shown from the fact that they were found in longitudinal sections which came from near the centre of the nerve. In cross sections these round cells were difficult to distinguish from the cross sections of the nerve nuclei, but nevertheless we could distinguish that there was a much larger number of round bodies between the nerve cells than in sections of normal nerves. All the nerves were not affected alike by this interstitial process; it varied also in different places of the same nerve. Two ciliary nerves showed such accumulations of round cells in a very slight degree. For short distances they were entirely wanting. The axis cylinders were always preserved, and in preparations colored with carmine were easily to be seen, both in longitudinal and cross sections. The medullary sheath was also perfectly well preserved in most places.

In all sections of the *retina* the different layers were distinct (fig. 3). The pigment layer was sometimes detached from the choroid by a thin layer of exudation. In one place I found an irregularity in this layer which seemed to have been caused by a proliferation of the pigment cells. In isolated places the epithelium was separated from the rods and cones by an amorphous exudation, causing small detachments.

Müller's fibres were proliferous in places, and extended beyond the anterior surface of the retina.

The *optic nerve* was normal except a slight round-cell infiltration of its interstitial connective tissue in the region of the lamina cribrosa (13, fig. 3). The sheaths were also normal.

The *vitreous* was pathological in that it was infiltrated with round cells in its anterior part, where it came in contact with the ciliary body.

The most interesting peculiarity of the above examination was the enormous thickening of the choroid, which has been equalled in only one case that I know of—that of H. Pagenstecher. I have found the following similar cases: Adolf Alt¹ describes five cases which he had observed, in which the choroid was very thick, in one case four times the normal. The ciliary nerves were normal. He further quotes a similar case from Donders and Pagenstecher. H. Pagenstecher has published a case in these ARCHIVES (vol. viii, p. 65) in which the choroid was much thickened. In the text we find it put down at 0.2–1.2 *cm.* His figure, however, does not agree with the text. The section of the globe was drawn double the natural dimensions, and the thickness of the choroid reaches only 6 *mm.* in its thickest part; it can therefore have been only 2.5 *mm.* He could not find the ciliary nerves in his case.

B. Steinheim² reports two cases in which the choroid was 0.45 and 0.75 *mm.* thick. The ciliary nerves were normal. A third case by the same author (anatomical examination by Prof. Sattler) showed a purulent infiltration of the retina and choroid, but these membranes were not particularly thick; the ciliary nerves were surrounded by round cells.

In almost all of these cases the thickening of the choroid was caused by round-cell infiltration; in the case of H. Pagenstecher alone the tissue was principally fibrous connective tissue, arranged like a network, in the meshes of which round, spindle-shaped, and stellate cells were found. The meshes were covered with a distinct endothelium. In this case the eye had been removed after 6 weeks, and notwithstanding this short time, the development of the tissue had gone so far, while in our case, in which the eye remained in for 9 weeks, the choroid was thickened only by granulation tissue. Our case has another peculiarity, viz.: that we find giant cells and epitheloid cells mixed in the granulation tissue in great quantities. In the paper already referred to, Manfredi describes a case in which there was a production

¹“On the anatomical causes and the nature of sympathetic ophth.” These ARCHIVES, vol. v, p. 395.

²“Zur Casuistic der symp. Ophth.” These ARCHIVES, vol. ix, p. 43. (Germ. edition.)

of true tubercles in the choroid and ciliary body. Heredity was not entirely wanting (a brother having died of phthisis of the lungs), and the patient had chronic glaucoma for which he had had an iridectomy. After a few months he had sympathy and the first eye was enucleated. The choroid was 1 *mm.* thick in the region of the papilla, and miliary tubercles were seen all over the choroid. They had the structure of true tubercles (granulation tissue, in the centre of which were giant cells) and were partially caseous. The ciliary portion of the retina was also thickened by round-cell infiltration, with giant and epitheloid cells between the round ones.

In the same paper Manfredi described a case of irido-choroiditis in which iridectomy had been made on account of secondary glaucoma, after which sympathy manifested itself. In this he found the same elements as above described, and in the same localities, but no trace of tubercles. Unfortunately he does not state the length of the disease. This case corresponds to ours. The characteristic elements of tubercles were present, but they were not arranged accordingly. Our case is also analogous to what E. Ziegler¹ has produced by experiment, notwithstanding the fact that our patient was a strong, healthy country girl in whom no hereditary tendency could be made out.

The changes which we have noted in regard to the ciliary nerve, were due to an *interstitial neuritis*, characterized by accumulations of small round cells within the tissues. The changes are of a slight degree, for nowhere had they destroyed the nerve, since they could be easily followed in their course.

We can therefore conclude that the power of conduction remained in the ciliary nerve, and that the sympathetic process was carried by their agency to the other eye. This seems to be the more probable, since the optic nerve as well as its sheaths have been found normal.

Besides the cases already cited, we find the following in the literature of the subject concerning changes in the ciliary nerves in sympathetic inflammation.

¹ "Experimental examinations on the origin of tubercular elements." Wurzburg, 1875.

First of all the important case of Goldzieher,¹ in which the nerves were thickly infiltrated with round cells. The nerve fibres were normal, but between them round cells and nuclei were found everywhere. This corresponds precisely to our case. Goldzieher further remarks that the round cells were grouped patches within the nerves, by which the nerve fibres had been compressed. I have not been able to find this condition in our case. Iwanoff² states in one case "the membrane of Schwann was thickened, and there were swellings produced by accumulations of nuclei," and in a second case there was only a thickening of Schwann's membrane.

Alt also cites a case (*l. c.*, p. 288) observed in the clinic at Utrecht³ in which there was fatty degeneration of the ciliary nerves.⁴

Finally I would like to express my thanks to Prof. Hirschberg and to Dr. Friedländer for their kind assistance during the above examination.

Explanation of the Figures.

Fig. 1.—Horizontal section through the left eye. Natural size. 1. Cornea. 2. Scar in the region of perforation. 3. Sclera. 4,4. Thickened choroid. 5. Retina. 6. Shrunken vitreous. 7. Proliferated iris and ciliary body.

Fig. 2.—Anterior, fig. 3, posterior portion of the globe but little magnified; loupe ($\frac{2.5}{1}$).

In fig. 2 the anterior part of the globe seems to be compressed.

¹ *Klin. Monatsblätter*, 1877, p. 405.

² "Mooren über symp. Gesichtsstörungen," Berlin, 1869, Anhang.

³ *Utrechter Jahresbericht*, 1865, p. 58, 3.

⁴ The author, whose paper appeared in Aug., 1881, could of course not compare an elaborate article by Dr. Ayres, of New York, which appeared in the September number of the English edition of these ARCHIVES, vol. x, No. 3. Dr. Ayres reports the examination of 8 eyes removed for sympathetic ophthalmia by Dr. Knapp. Some of them seemed to have exhibited an earlier stage of irritation of the ciliary nerves than that to which the author has referred. Some showed, in the main, just such conditions as he records, and again conditions still further advanced than a simple slight infiltration of the nerves, viz.: total suppuration and partial destruction of the ciliary nerves. In some, A. also refers to the enormous thickening of the choroid, and in one case to true tubercles in the iris but not in the choroid. The description is illustrated by a plate, Tab. vi, b.

Figs. 2 and 3.—1-7 as in fig. 1. 8. Collapsed lens capsule. 9. New-formed connective tissue behind the ciliary body. 10. Exudation between the pigment layer and that of the rods and cones. 11. Exudation between the lam. vit. chor. and the pig. layer of retina. 12. Protruding iris. 13. Optic nerve.

Fig. 4, *a* and *b*.—Ciliary nerves, teased preparation; nuclear coloration, magnified 275:1. *a*, somewhat more; *b*, less changed part. 1, normal nerve nuclei; 2, round cells.

Fig. 5.—Section through the choroid magnified 275:1. 1. Epitheloid elements. 2. Giant cells. 3. Cross section of blood-vessel. 4. Capillaries. 5. Pigment cells.

A NEW CASE OF PULSATING EXOPHTHALMUS OF BOTH EYES.

BY DR. A. NIEDEN, OF BOCHUM.

(Translated by WILLIAM C. AYRES, M.D., NEW YORK.)

BY the presentation of a fourth case,¹ it would seem that chance had particularly favored me with bringing all the forms of the above disease to my personal observation.

The history of this newest case does not give us an etiology or pathogenesis which has not been made known by the researches of Sattler,² but it seems to present some peculiarities of sufficient interest for publication. For instance, the disease affected both eyes at the same time, a condition so rare that only four other cases of it are on record.³

There were other great peculiarities, and a new complication of symptoms, such as a complete loss of the sense of smell. But we will let the case speak for itself.

¹ *Zehender's Klin. Monatsbl. f. Augenk.*, vol. xiii, p. 38.

² Pulsating Exophth. in Graefe and Saemisch's *Hdb. d. ges. Augenheilk.*, vol. vi, 2, p. 846 u. f.

³ Velpeau : "Leçons Orales," vol. iii, p. 437, 1841, and

a. Cadwell : Erectile tumor of the orbit. *Bost. Med. & Surg. Journ.*, vol. xxiv, 1840.

b. Halstead (Noyes). *N. Y. Med. Jour.*, March, 1869, p. 664.

c. Morton: Orbit. aneur. disease and protrusion of the eyeball. *Amer. Jour. of the Med. Sci.*, vol. lx, July, 1870, p. 36; and Harlan: Case of traumatic aneur. of orbit. *Ibid.*, p. 46.

d. Grüning : A case of vascular protrusion of both eyeballs. Ligation of the left common carotid. Recovery. *These ARCHIVES*, vol. v, p. 40.

Mrs. Uhlander consulted me on March 3, on account of double images, which she had had for a few months, and which were of a very troublesome nature. They were present both for far and near vision. They were less when she looked to the left, and she was therefore in the habit of turning her head to the left in order to do away with them. On account of them she suffered a kind of vertigo which immediately disappeared on closing the eyes. She did not complain of headache. On further examination she said that on July 7th of the previous year she had had a severe fall on the back of her head. She fell from a step-ladder on the pavement. She was unconscious, and suffered from bleeding at the nose, but not from the ears. She vomited frequently, and was carried to the hospital. She regained consciousness after twelve hours, when she complained of continuous severe headache over the front and back part of her head, besides a peculiar noise in the left side of her head. The ear had not suffered, but the hearing was somewhat interfered with by the noises. The bleeding at the nose had subsided. After three days she could get up, and by request she was sent away from the hospital, not suffering from any grave head symptoms. The headache continued the same, and also the noises, but her general feeling was better, so that in fourteen days she could do her housework again. She noticed, however, that she could not smell, even the most pungent odors, but they sometimes made her sneeze. With this exception she experienced nothing unusual, and also a pregnancy of five months was not interfered with by her accident. Accordingly, on the 11th of November she was delivered of a strong healthy boy, and her confinement was entirely normal. Fourteen days after her delivery, or four and a half months after her accident, without having felt any thing peculiar, she noticed a sudden increase in the noises on the left side of her head, extending, at this time, also to the right side, and simultaneously a sense of pressure in her left eye. After a few hours her husband said he observed that the left eye was apparently more prominent than the right, and the patient complained of a continually increasing pressure from behind it. One morning she discovered that she saw double, and had such vertigo when she got up, that she had to retire again. She had loud noises in her head; the lid of the left eye was greatly stretched; great sensibility to pressure behind the eye. On the next day the left eye was more prominent, and the right commenced to protrude also. The

white of the eyes was red ; left more than right, and the upper lid of the left eye appeared swollen. She also now felt a sensation of pressure behind the right eye, as if the eye was pushed forward with great force. The double images were very annoying. When quiet all her symptoms were less severe. In the morning, after a good night's rest, the eyes were not so prominent, but became more so during the day, when her other symptoms also increased. The patient now remained quiet, doing no housework, and her condition gradually improved. First the right eye began to recede into the orbit ; the white of the eyes became clearer, and a dark discoloration of the lids began to disappear. The recession of the left eye was much slower, and the diminution of the tumor was always more conspicuous in the morning. The subjective symptoms of noises and beating in the head remained stationary. In the morning the double images were not so annoying as in the evening. There were no other permanent defects of vision.

Eight months after having fallen on the back of her head, and fourteen weeks after the appearance of the exophthalmus the patient consulted me.

She was 36 years old, and of small stature ; had a peculiar stare which was caused by the protrusion of both eyes. The left eye was prominent, and had compressed the lid, so that it had a dark, livid color ; same in the right lid. The right eye was more prominent than normal, causing the patient to look as if she had morb. Basedow. A rapid examination of the heart and throat, however, soon showed this not to be the case. The inspection of the conj. bulbi showing large tortuous veins running radially, suggested some disturbance in the blood circulation in the retro-orbital cavity. There was nothing abnormal in the pupil, nor in the blood-vessels of the iris. The stasis in the conjunctival veins was less marked in right eye, but single dilated veins ran over the sclera. An effort to press the eyes back into their orbits, met with a strong resistance, especially in the left. If both hands were on the eyes at the same time a rhythmical pulsation could be felt in both, which was simultaneous with the beat of the pulse.

When the ear was applied to the left eye, a noise was heard which was not continuous, on account of a regular increase and diminution in the tone, which was also simultaneous with the pulse beat. The same was heard in the right eye, but not so loud. The bruit was heard over the whole anterior part of the head,

but louder over the eyeballs. She did not complain of pain on pressing upon the eyes. Compression of the left carotid caused instant cessation of all the symptoms on both sides, but a faint noise was still heard in the eye. Compression of the right carotid alone had no effect. She could not stand simultaneous pressure on both, but she experienced nothing unpleasant in compressing the left alone. The left eye was dislocated somewhat downward and inward, but its motions were normal, both as to its own movements and to binocular fixation. The only defect seems to have been upward and outward, where the left eye was somewhat restricted in its movements.

The appearance of double images will be seen to have been the result of the exophthalmus and not of muscular paresis. The ophthalmoscope showed both of the eyes fairly normal; in the left there was injection of the vessels of the retina and choroid, but pulsation could not be made out. S oc. utr.=1. F normal.

In this case we must consider that the cause of the disease was the injury she received, and that the left eye was primarily, the right secondarily affected. All the symptoms commenced four and a half months after the injury. From the symptoms it can be concluded that the fall produced an internal injury at the base of the skull; and besides this, the fact that immediately after the injury she lost all sense of smell, should make us consider that a fracture of the anterior part of the base of the skull was probably done by contre-coup. Since the other symptoms point to the presence of a rupture of the left internal carotid in the cavernous sinus, we may also conclude that there was a comminution of the lamina cribrosa of the ethmoid bone, which lies just beneath the olfactory bulb. In the same way a splinter of bone must have done direct injury to the walls of the left carotid artery. We must also consider that the rupture was not an extensive one, since the subjective symptoms of noises in the left side were present without any striking objective symptoms as the result of this communication of the arterial and venous systems of the ear. Several months elapsed after the injury, and indeed it required a further disturbance of pressure (she was delivered of a child in the meantime) to cause a more extensive rupt-

ure of the arterial walls, to produce the later symptoms. The rapid protrusion of both eyes, the venous stasis in the conjunctival blood-vessels and those of the lids, and the complication of the right eye twenty-four hours after the left, force us to consider that a later rupture occurred, which so changed the circulation in the sinus circularis, that it had a great influence on the circulation of the right orbit. It does not seem probable that the fracture of the ethmoid bone could have ruptured both internal carotid arteries, and indeed the entire history contradicts such an idea, since a whole day intervened between the exophthalmus of the left and that of the right eye. The changes produced by pressure on the left carotid, and the fact that pressure on the right had no effect, indicates that the condition of the right eye was only a secondary complication.

It is also of interest, that the principal rupture of the artery did not occur during the act of labor, but that it was thereby probably only prepared or facilitated.

As to the further course of the case, I would remark that, since it had improved so much of itself, I thought it better to wait awhile before advising any active interference.

Since she could easily bear pressure on the left carotid artery, I showed her and her husband how to do it, and told her to cause it to be done for several hours every day. I could not detect any diminution of the bruit after the pressure was discontinued, nevertheless the patient said the subjective symptoms were improved, but I am of opinion that it will be a long time before such treatment can do away with the objective symptoms of double images, pulsation, etc.

I will not undertake to ligate the carotid artery as long as she nourishes her child, but at any rate will give the termination of the case at some future period.

SOME OBSERVATIONS UPON TUMORS OF THE EYE.

BY PROF. E. ADAMÜK, OF KASAN, RUSSIA.

Translated by Dr. PORTER FARLEY, of Rochester, N. Y.

(*With plate ii.*)

THE interest pertaining to the subject of ocular tumors prompts me to publish some of my observations upon them. My chief object is to describe some cases of melanotic tumors of the eyeball, which, as is well known, are not of frequent occurrence. Hirschberg, in describing a case of pericorneal melano-sarcoma, remarks, that such tumors are among the rarest neoplasms of the eye. Noyes also, after a critical analysis of all the cases known to him, concludes that this kind of tumor is very rare. I accordingly present some observations relating to cases which have been brought to our clinic.

CASE I.—*Epi-ocular melano-sarcoma.*

The first case was that of Sarah Wagopowa, a Tartar, who appeared at the clinic with a tumor projecting from the left orbit. On account of its unusual size I caused it to be photographed (see fig. 1, plate ii).

The cut shows the breadth of the tumor, and the unevenness of its surface, from which blood oozed at various places, and which was of a dark grayish color. The patient was a strong, healthy brunette, who, according to her own statement, had not exposed her eyes to any unfavorable influences, and had experienced no severe sickness, although she had suffered from intermittent fever

of a mild type. She was unable to give any cause for her disease. The tumor appeared some years before, though at exactly what time she could not state. It had at first the appearance of a black nodule upon the lower part of the eye. It grew slowly. She had also, in front of the ear, under the skin, a smooth, long, hard tumor, as large as a walnut, which appeared like an hypertrophied and degenerated lymphatic gland. No further extension of the disease could be seen. It had developed so far and showed such a tendency to spread, that its removal was imperatively necessary. To this the patient consented. As shown in the cut the tumor extended so far beyond the limits of the orbit, that it was impossible by digital examination to determine what were its connections with the eyeball and with the walls of the orbit. Its mobility indicated that it was not attached to the latter. When the patient was chloroformed, an incision was made in the direction of the outer angle of the lids. The finger could then be passed deeply into the orbit, and it was found that the tumor was not adherent to its walls, and furthermore, that the posterior surface of the eyeball was not involved in the growth. The removal of the tumor was begun from this side. The method followed was that of ordinary enucleation, in which the recti muscles and optic nerve are severed as nearly as possible to the eyeball. Anteriorly it was easy with the scissors to detach the tumor from the eyelids. It then appeared that the lids were scarcely wounded, but they were decidedly atrophied, for they had been stretched and pressed by the growth. After the removal of the tumor and eyeball an examination of the orbit was made. The degenerated gland, although it had no strong adhesions, was then removed. As the tumor was quite hard, a section was immediately made through it, when it was discovered that it was entirely extra-ocular,—that is, it did not penetrate the eyeball. It consisted of two parts, the smaller of which lay directly opposite the cornea (fig. 2), while the larger part surrounded the lower portion of the sclera, extending back almost to the optic nerve. The upper and outer part of the eyeball was nearly free. That part upon the cornea was less pigmented than the other, which, upon its cut surface, appeared almost black. All this is shown in the cut. Both parts of the tumor lay close together, but between them was a scarcely noticeable furrow, which, nevertheless, extended in as far as the sclera. At a part somewhat outside the vertical meridian of the eye, at the margin of the cornea, the two parts of the tumor united into

one root which sprung from the sclera. Within the eye, at its outer part, the retina was partially detached, as is somewhat indistinctly shown in the cut. Under the detached retina, upon the choroid and sclera, were no traces of the tumor. Microscopic examination of different parts of the tumor showed it to be of a sarcomatous character, with irregular pigmentation of some of the cells and of their large nuclei. Irregularly scattered masses of almost free pigment were visible. This is all shown in the cut (fig. 3). The enucleated lymphatic gland presented the same appearance. Healing proceeded regularly, so that after three weeks the patient left the clinic fully recovered.

Here we have the pericorneal melano-sarcoma in the highest stage of its development. The case shows that these tumors have very little tendency to penetrate the eyeball. In this case the inner layers of the sclera and cornea were not affected, so that the tumor could be detached without injuring the eyeball. It is difficult to say whether by such an operation a reappearance of the disease could be avoided, but it is easily demonstrable that the tumor simply spreads over the surface of the eyeball. Its slight tendency to penetrate the ball is the good feature of this tumor, and this tendency is apparently less the more pigmented the growth. This conclusion is deduced from the following observations.

CASE 2.—*Extra-ocular and intra-ocular sarcoma.*

Alexander Curmin, a healthy peasant, 35 years of age, appeared at the clinic. All the dimensions of his left eye were greatly enlarged. It was impossible for him to close his eyelids. He could not state exactly when his trouble began, but his attention had been called to it some months before by this inability to close his eyelids. No signs of violence were to be seen, and there had been no inflammation about the eye. Upon external examination it was easy to see that the cornea was intact; but the opaque lens lay immediately behind it, so that the anterior chamber was obliterated. The pupil was drawn over to one side, as in extreme cases of glaucoma.

With such a typical picture of the glaucomatous process I cannot forbear calling attention to some of its symptoms.

For instance, it was evident in this case that the adhesions of the peripheral part of the iris with the cornea were due to increased intra-ocular pressure. That is to say, they were due to some influence behind the dislocated lens, but they were in no sense the cause of the increased pressure. I therefore do not attribute to these adhesions the slightest causative influence upon glaucoma; but I consider them like the excavated papilla, the shallow anterior chamber, the dilated pupil, the cataract, etc., as results of an increased intra-ocular pressure.

Judging from these symptoms alone this would have been considered a case of glaucoma; but upon consideration of the comparative youth of the patient and the symmetrical enlargement in all directions of the eyeball, which was all the more noticeable from the approximation of the lens to the cornea, an intra-ocular tumor was suspected. Enucleation was proposed, which, on account of the deformity and the frequent lancinating pain, the patient consented to. The operation was begun from below, where the surface of the ball was most regular, and was conducted in the usual manner, being completed with the scissors. After the detachment of the muscles it was easy to feel with the finger that the tumor was attached to the optic nerve, which, accordingly, was cut through, and removed with the eyeball. Upon examining the bottom of the orbit it was found that portions of the tumor still remained about the stump of the nerve, and to remove all traces of these it was necessary to make a few strokes with the curved scissors. The bleeding was very slight. Healing was rapid, so that after two weeks the patient could wear an artificial eye, and was dismissed from the clinic.

The enucleated eye was so hard that a section of it was made immediately, when it appeared that the tumor was almost entirely extra-ocular (see fig. 4, plate ii). This cut shows the remarkable thinness and conical shape of the cornea, and the extreme atrophy of the iris, of which only traces are to be seen about the base of the cornea. The tumor occupied the upper part of the eyeball, and had extended over the optic nerve. Upon the surface of the

ball, in addition to its connecting membranes, it was covered with a thin, dense membrane, which was doubtless the thickened capsule of Tenon. The same cut shows that at a point near the equator the outer layers of the sclera have been penetrated by the elements of the tumor. Aside from the displacement forward of the cataractous lens the interior of the eye seemed upon casual inspection to be in the normal condition. But upon closer examination two roundish elevations could be seen upon the surface of the ciliary body at the points marked *a* and *a*. A section through these elevations showed that they were caused by the development of the neoplasm in the tissue of the ciliary body. The pigmented layer alone was not invaded. The thickness of this part was about 3 *mm*. This degeneration of the ciliary body was separated from the principal tumor by the almost normal sclera. But after making several sections it could be seen that here and there the elements of the tumor had penetrated the sclera, as shown in the cut.

The elements of the tumor penetrated the sclera in zig-zag and oblique directions. The growth being so large externally and so small within the eye, the conclusion was unavoidable that it had begun externally and later had penetrated the ball. Since this extension in the region of the equator had followed the direction of the canal of the *venæ vorticosæ*, which had been exposed to the pressure of the tumor outside of the eye, a decided stasis must have been caused in these veins. This caused all the signs of a glaucomatous process, viz., the increase and liquefaction of the vitreous, the obliteration of the anterior chamber, the displacement forward of the lens, the adhesion of the iris, etc. Since the tumor had developed at a late stage within the eye and had not acted suddenly to displace the lens and cause the atrophy of the iris which we here see, these changes must have been due to the influence of the increased intra-ocular pressure which is here so strongly marked. This observation convinced me of the importance of stasis in the *venæ vorticosæ* as an element in exciting the glaucomatous process.

In this case we observe also a pericorneal tumor, but one which penetrated the eye. The color of the tumor indicated the presence of but very little pigment. Upon microscopic examination the same elements were seen as in the previous case; but there was very little pigment, so that the word "melanoid" was here scarcely applicable.

CASE 3.—*Episcleral melano-sarcoma removed with preservation of the eyeball.*

In addition to these two cases and soon following them, I saw a case of extra-ocular tumor upon the under surface of the right eye of a peasant 40 years of age. The patient's eye could not be seen, but the space between his eyelids was occupied by a prominent black, smooth tumor, as large as a walnut, which was still visible when he attempted to close his lids. Only by forcibly distending the eyelids was it possible to see that the cornea turned upward and was transparent. $V = 0$. Upon opening the lids it was easy to see that the tumor was on the under surface of the sclera. It began at the margin of the cornea, and extended back to the equator. The tumor is shown in cut fig. 5, plate ii, in which *A* shows its surface, and *B* a section made after the preparation had lain a month in alcohol. Both are of natural size. The patient, as long as he could remember, had had upon the under part of this eye a black speck, which had increased rapidly of late years, but which could still be covered with the eyelids. For the last six weeks, however, the tumor had projected beyond the lids so that it was impossible to cover it. The eye was irritated; there were weeping and strong blepharospasm even in the other eye. This case was easily diagnosed as melano-sarcoma, of the nature described by Hirschberg, in the article before referred to. In view of Hirschberg's case and my own observations, all of which made probable the superficial character of the tumor, I determined to remove it without sacrificing the eyeball. This was immediately done. The growth was easily removed with the scissors and scalpel. The subjacent sclera appeared perfectly healthy. Healing was rapid, so that five days later no trace of the wound could be seen. The eye retained its normal position and mobility, and there was binocular vision. The patient was positively charged to return to the clinic upon the appearance of the slightest signs of a new growth. More than a year has since elapsed,

and there is no return of the disease. Section of the tumor showed a dense black surface. At one point, marked *o* in the cut, there was a colorless spot. Upon microscopic examination it showed the same appearance as that of fig. 3, viz., spindle-form sarcomatous cells, more or less pigmented.

This case shows that these tumors can be easily removed without sacrificing the eyeball, and that the earlier the operation is undertaken the easier it will be. The other cases show that even when considerably developed they have very little tendency to penetrate the eyeball, and all the less tendency so to do the more pigmented they are. Therefore, even when quite large, their removal may be attempted without the enucleation of the eye.

The etiology of these tumors can be explained only on Cohnheim's theory, that they develop from the remains of the primary ocular vesicle in cases of coloboma oculi.

It is well to state the entire number of ocular tumors which have been seen in this clinic. There have been 58 out of 16,000 accurately registered patients. Of the 58 cases, 21 occurred in women. Of the whole number 5 were cases of exostosis of the orbital walls. There were 37 cases of various degenerations of the lids; so that there remained only 16 cases of primary tumor of the eyeball. Of these there were 7 cases of degeneration occurring in small children. The remaining 9 cases were in older people, and the growths were not greatly developed. The ages of those not elsewhere referred to were 21, 26, 45, and 48 years. All were men and no operations were performed on them. There was also a patient, 55 years of age, whose eye was greatly displaced forward. It was of normal size, but the cornea was destroyed so that its interior could not be seen. This patient, on account of his pain, willingly underwent operation. It proved that he had melano-sarcoma of the choroid. In this case the tumor occupied only the posterior half of the orbit, and had developed principally upon the optic nerve, which had attained a diameter greater than that of the eyeball. This condition had caused the exophthalmus and degeneration of the cornea.

CASE 4.—*Intra-ocular melanoma, causing glaucoma, and subsequently shrinkage of the globe.*

The last of this class of cases was that of a woman 66 years of age. The history of the tumor was somewhat unique, so that I did not determine upon publishing a detailed description of it until after I had been assured of the possibility of such a result by a description, given in the above-named article by Dr. Noyes, of a case which occurred in the practice of Dr. Mathewson, of Brooklyn.

This woman, 65 years of age, consulted me in May. She had the decided symptoms of glaucoma in the left eye, which, according to her statement, had long ago lost its sight. Until recently she had suffered no pain, but now it had begun, accompanied with inflammation. The diseased eye was hyperæmic; the pupil was dilated; the anterior chamber was shallow and there was cataract. The interior of the eye, therefore, could not be seen. The ball was stone-hard. In view of these symptoms a diagnosis of glaucoma was made and iridectomy was recommended. But as the clinic was at this time closed, and as the patient would not submit to an operation elsewhere, it was necessary to resort to therapeutical measures. Quinine was ordered internally and eserine locally. No more was seen of the patient during the summer. In September, however, she appeared again. Her eye was atrophied to the size of a bean. In spite of this, pain recurred from time to time; so that the patient willingly entered the clinic to submit to an enucleation. As I had previously observed such an atrophy, although without pains, as a consequence of glaucoma, I had predicted this result for this case. After the eye was removed I noticed the black color of the section of the nerve, and accordingly examined the eyeball. Upon cutting through it I found that the entire space within the shrunken sclera was filled with a black mass which appeared to consist only of pigment. No other parts of the eye could be distinguished. Upon microscopic examination this black mass appeared to be nothing else than a carcinoma melanodes, whose elements could be seen upon the cut end of the nerve, giving it its black color.

There can be no doubt in this case of the early existence of the tumor in the eye, and that the glaucomatous attack was due to its development. It is difficult to say what caused this unusual ending of the tumor. Whether the atrophy was due to

insufficient blood supply, stoppage of the vessels, or their rupture in consequence of the pressure of the sclera, which at this age is so inelastic, or whether it was due to some other cause, is hard to say ; and all the more so for the reason that upon the optic nerve, where the above-named conditions did not exist, and where, after the removal of the eye, there followed no return of the disease, no further development of the tumor was noticeable.

Kasan, Feb. 15, 1881.

SYMPATHETIC INFLAMMATION.

By S. C. AYRES, M.D., CINCINNATI.

THE following cases are reported as having some bearing on the very important and still obscure subject of sympathetic ophthalmia. An advance has been made in our knowledge within the past few years by the careful observations and examinations of Mauthner, Alt, Snellen, Brailey, and many others. The question of the transmission of sympathetic ophthalmia is not yet settled, but we are nearer its solution than we ever were, and more rational methods are now in vogue for the treatment of the sympathetically affected eye, as well as the injured one, than were formerly. As we have still much to learn, I take the liberty of presenting these cases somewhat in detail. They have a direct bearing on the subject of the transmission of the sympathetic influence, and show that the incarceration of the optic and ciliary nerves will cause sympathetic irritation and plastic iritis, and that neuritis is associated with a sympathetic iritis serosa.

CASE 1.—Stump after panophthalmitis enucleated. Sympathetic ophthalmia one year later, cured by excision of optic nerve.

Mrs. D., 46. The records of the Cin. Hosp. show that she was admitted Dec. 23, '72, on account of threatened panophthalmitis of the left eye. The following history was obtained from her. About ten years ago she had a purulent ophthalmia, resulting from the application of her own urine to her eye for some trivial trouble. Having a specific vaginal discharge at the time, her

treatment was followed by a violent purulent inflammation, which caused sloughing of the left cornea and the subsequent development of a corneal staphyloma. She says that the staphyloma was punctured several times on account of severe pain. About one week before admission the eye became painful. She continued to do housework until the excessive pain forced her to enter the hospital. When first seen the lids were œdematous, the conjunctiva chemotic, and the ball exquisitely sensitive. I proposed an immediate enucleation, but to this she would not consent, and warm poultices were ordered. The inflammation subsided as usual, and about six weeks later I enucleated the now slightly-shrunken globe. There was nothing unusual in the operation, and I did not think that I severed the optic nerve too close to the ball. The incision healed kindly, and she was discharged March 13, '73.

On Feb. 24, 1874, she was readmitted with well-marked symptoms of sympathetic inflammation in her right eye.

She complained of pain in the left orbit, and said that it had annoyed her for several months. She got some relief by pressing firmly into the apex of the orbit with one of her fingers, or by crowding her handkerchief into it and holding it there. The conjunctiva presented a healthy appearance, but it was puckered around the end of the optic nerve, which now felt as if it had not been cut off close enough to the apex of the orbit. There were three cicatricial bands extending from it, resembling plaits or folds in the conjunctiva.

One extended upward and outward, one upward and inward, and the third downward and inward. They seemed to make some traction on the end of the optic nerve, for pressure on it gave her relief. She said that she used to sit for a half an hour or an hour at a time with her hand pressing firmly into the socket.

In the right eye the aqueous was turbid, the iris discolored, and there was some ciliary injection. The pupil was sluggish and there were some slight synechiæ. She could not read ordinary print, but could see objects dimly around the room. I immediately began a vigorous treatment for the relief of the right eye. The artificial leech was applied to the temple, frequent instillations of atropia were used, and warm poultices ordered.

As soon as the above symptoms had subsided, I anæsthetized her, and made a resection of the optic nerve by separating the conjunctiva and orbital tissue, including the ocular muscles, from

around the distal end of the optic nerve down to the apex of the orbit. Then seizing it with fixation forceps, I cut it off close to the bone.

The right eye steadily improved, and when she was discharged, May 11th, it was quite free from irritation, and her vision for near and far was quite good. The synechiæ soon gave way and the ciliary injection subsided. The pain in the left orbit also disappeared, and there was no longer a desire to make pressure upon the end of the optic nerve. From that time to the present she has had no trouble in her good eye. I saw her in fall, 1881, and she said that it had given her no trouble since the last operation.

CASE 2.—Fully developed sympathetic ophthalmia cured by long-continued poulticing and other means.

J. K. received an injury to the left eye Feb. 13, 1878, in the following manner: He was standing in the school-room near a window when it was shattered by a snowball thrown with great force by some one outside. Fragments of the glass inflicted an irregular V-shaped wound in the upper half of the cornea. The apex of the V was very near the centre of the cornea, and the incisions terminated at the corneo-scleral margin. Vision was lost immediately, but the eye was not painful until June 1st, when it became slightly inflamed.

July 15th.—After a hard day's work in the harvest-field, he found the vision of his right eye very much impaired. The eyeball was injected and slightly tender to touch. He applied some home remedies, but his vision continued steadily to fail. Finding that the inflammation would not yield, and becoming alarmed, he applied for treatment July 29th. The globe was found intensely injected, especially in the ciliary region; the iris was discolored, and presented a swollen, spongy appearance, and was completely adherent to the capsule of the lens. $V = \frac{2}{100}$. In fact the eye presented a typical picture of sympathetic iridocyclitis. A strong solution of sulphate of atropia was used, and the next day the pupil had dilated very slightly and irregularly.

From Aug. 1st to 5th he remained in the hospital, and warm flax-seed poultices were applied six hours each day, and the atropine was used every two hours. The weather being warm, he preferred to go home, where he could be more comfortable. He left with instructions to continue treatment, and report from time to time by letter. Nothing was heard of him until Nov. 12th,

when he returned with the statement that for *one hundred and five days* he had faithfully carried out instructions, and poulticed the eye daily from six to eight hours. Strange as it may seem, the eye was much better. The ciliary injection had disappeared; the pupil was moderately dilated, and he could count fingers at 15.'

The left eye being tender and irritable, it was enucleated, and a fragment of glass found imbedded in the ciliary body.

April 29, 1879.—The right eye has continued steadily to improve since his last visit. The sclerotic is clear and white, and the iris presents a healthy appearance. Vision is now $\frac{1}{4}$ $\frac{5}{8}$, and with 1.25 D M, $V = \frac{1}{3}$ $\frac{5}{8}$. He can read Sn. No. 1. The media are clear, and the fundus oculi is normal. A letter received from him a few months later says that he is studying telegraphing, and that his eye is comfortable, and he is able to read and write as long as he wishes.

Considering the condition of his eye when first seen, the recovery may be considered very encouraging, if not remarkable. The poultices had a quieting effect from the very first, and he needed no urging to continue their use. One might, on general principles, say that poultices applied to the cornea so constantly and for so long a time would produce maceration, purulent infiltration, and perhaps destruction of that all-important tunic.

CASE 3.—Rupture of sclerotic—Sympathetic ophthalmia cured with prolonged poulticing.

J. M. N., æt. 50, says that he was hurriedly taking a shovel away from one of his workmen, and seized it with his left hand, and drew it toward himself with such force as to strike his eye, with the effect of rupturing the sclerotic. Whether it was the end of the handle of the shovel or the first joint of his thumb which struck him he is uncertain. The accident occurred July 26th, and he came for examination Aug. 2, 1881. The rupture was directly upward, and nearly half an inch long and irregular. The anterior chamber was filled with blood, and there was extensive ecchymosis under the conjunctiva and in the orbital tissues. All vision was lost almost immediately after the receipt of the injury.

At present the eye is not painful. The edges of the rupture gape but are held by the conjunctiva. The right eye is perfect and presents no traces of sympathetic irritation. Rest and cold

applications were ordered, the calamity of sympathetic inflammation was vividly depicted, and the patient warned to return on the slightest suspicion of danger. Notwithstanding the repeated warnings, he paid no attention to the early symptoms of sympathetic trouble when they came, and did not return until about twelve days after the vision of his good eye had begun to fail. On Sept. 13th, the vision of his right eye was only equal to counting fingers at 18 inches. It presented all the well-marked symptoms of sympathetic irido-cyclitis. If we take his statements as to the time the eye began to fail, it was only thirty-six days from the date of the injury.

His left eye appeared very much as it did at his first visit. The ecchymosis had slightly absorbed, but the ball, so far as one could see, was apparently filled with blood. He was sent to the hospital, where he remained until Oct. 1st. During this time warm flax-seed poultices were applied from six to eight hours a day over the right eye. Occasionally he would apply one over the injured eye as it seemed to have a soothing effect.

The improvement in the right eye was slow but satisfactory. At the time of leaving he could count fingers at 10', and the injection in the ciliary zone was much diminished, and the iris presented a more healthy appearance.

Upon his return, Oct. 13th, both eyes were found to have improved. Vision of R. E. = $\frac{20}{100}$, and with the left eye he could count fingers at 3'. The right pupil was moderately dilated. There were some synechiæ downward and inward. The optic disc was swollen and œdematous, and the retinal vessels at its margin were blurred and considerably arched forward by exudation underneath. The vitreous was clear, but the anterior lens capsule was dotted with minute pigment points from adhesions which had let go. The fundus of the left eye could not be seen, but there was in the vitreous a large grayish mass downward and inward, which moved freely and was probably the remnant of the intra-ocular hemorrhage.

Nov. 14.—Reported again. There was marked improvement in the right eye; $V = \frac{20}{40}$, and with +0.75 sph., $V = \frac{20}{30}$. The pupil was about as at his last visit, and the iris more natural in color. The papillitis was much better, and the outlines of the disc were clearly defined. With the L. E. counted fingers at 4'. He has continued the poultices from four to six hours a day since his last visit.

Dec. 16—The right eye was about as it was last month. The optic disc was clearer, with but slight traces of swelling.

March 6, 1882.—Vision in the right eye is now, with the correcting-glass, nearly perfect. The media are clear, the papillitis has entirely disappeared, the disc and the vessels in it are sharply defined. He has discontinued all treatment since his last visit in December, and he has been superintending his business. The eye gives him no pain, but when he becomes heated from exercise of any kind, he says his vision is slightly blurred.

The left eye has so far cleared that the disc can be seen, and appears elongated vertically owing to change in the curvature of the cornea. With $+9D$ sph., he counts fingers at 14'. The iris has entirely disappeared, no trace of it being visible. The grayish coagulum has diminished in size.

In the case of Mrs. D. (1) we have a well-defined instance of sympathetic inflammation arising from the incarceration of the optic and ciliary nerves in the wound made by an ordinary enucleation. It is quite evident that considerable irritation had preceded the development of the plastic iritis. Her accommodation was greatly interfered with, and even the use of convex glasses did not relieve her. Then there was the desire to press something into the orbit, in order to give relief to the feeling of discomfort which she almost constantly experienced. As long as this pressure continued she was comfortable, but when it was discontinued the same disagreeable sensations returned. It seemed reasonable to conclude that there was a source of irritation at the apex of the orbit, and the issue of the case proves this. The removal of the stump of the optic nerve gave her complete relief. The irritation kept on increasing until she had a well-marked plastic iritis. Prompt and energetic treatment arrested its progress, and the resection of the nerve removed the cause of the trouble, and she made an excellent recovery. I saw her in the ward last December reading a newspaper, and she said that she had experienced no inconvenience since she recovered from the operation. In the case reported by Dr. Hasket Derby (1874), he made a resection of the optic nerve, which was followed by a marked amelioration of all the symptoms. This was

not, however, permanent, for in a few months there was an exacerbation of the symptoms resulting in permanent damage to vision.

Mrs. D. was not examined with the ophthalmoscope during this treatment, and it is therefore impossible to say what changes in the retina or optic disc may have occurred. Since treating the case of Mr. N., I greatly regret this, for I feel confident that the optic nerve participates much more frequently than is supposed. The turbidity of the aqueous in cases of acute iritis, and the partial closure of the pupil, and the deposit of pigment on the capsule, or the formation of a secondary membrane, may interfere with the inspection of the fundus. As the media clear up, the eye should be examined repeatedly to determine whether or no evidences of neuritis are present. Mauthner discusses the possibility of sympathetic inflammation arising from enucleation by causing a crushing of the ciliary and optic nerves, and the contraction of the stump of the nerve in the cicatrix. He spoke of a patient of his own who suffers from sympathetic irritation, following an enucleation, where the left eye is totally unfit for work. He attributes it to a sympathetic neurosis, and thinks that the irritation may lie anywhere in the nerve tracts.

Mr. N.'s (2) case is one of peculiar interest, on account of the ophthalmoscopic examinations which were made. We had positive ocular proof of the neuritis as soon as the media were sufficiently clear to allow an inspection of the fundus. As this inflammation subsided his vision improved, and at his last visit was almost perfect. Plastic iritis and neuritis are here associated, and it is more than likely that the same could be demonstrated of many other cases were it not for the turbidity of the media. In this case the poultices had a very grateful and soothing influence on the eye. He preferred to keep them on as they made the eye comfortable and relieved the pain. While he was at home he used them somewhat according to his own judgment, varying the number of hours each day according to the indications. His treatment was kept up fully four months, and the result is certainly most gratifying. Mauthner ob-

serves that "many more cases of retinitis are sympathetic than those in which clear and unmistakable evidence of the fact can be obtained."

Dr. A. Alt reports in these ARCHIVES, vol. v, the results of the examination of 110 eyes enucleated for sympathetic inflammation. He found histologico-morbid affections of the optic nerve and retina in 79%, and of the ciliary nerves in but 16 $\frac{2}{3}$ %. Sympathetic irido-cyclitis was observed in only 3 $\frac{1}{4}$ %, and sympathetic irido-choroiditis in 27 $\frac{1}{2}$ %. He concludes that the whole nervous apparatus of the diseased eye participates in the transmission of the affection to the other. It would seem from his results that the optic nerve is a far more important factor than the ciliary nerves in the transmission of this dreaded disease.

Prof. Snellen, of Utrecht, in a paper before the International Congress of 1881, thus summarizes his views on the subject of sympathetic ophthalmitis:

1. The hypothesis that sympathetic ophthalmitis is explained by reflex action through the ciliary nerves is devoid of all convincing proofs.

2. Sympathetic ophthalmitis may be looked upon as proceeding from a septic choroiditis of a definite type, not improbably resulting from an abnormal continuity between the external tissues and the uvea.

3. The morbid change of the vessels, the increase of the lymphoid cells, and, perhaps also, the accumulation of microphytal organisms, are the guiding signs that may indicate the direction in which the morbid process is propagated.

4. The path of the transmission is most probably along the lymphatic spaces of the optic nerve. In discussing the question of parasitic microphytes he gives his own and also Leber's experiments. He instances a case where after enucleating an eye he cut through the cicatrix, and examined under the microscope the material which he scraped from its edge. "All the field was a living mass." "The same was found all over the choroid. The sheath of the nerve carefully split showed moving bodies, apparently micrococci."

Dr. W. A. Brailey, London, says "that the physical condition of the ciliary nerves and blood-vessels will not afford the necessary explanation, nor will that of the sclerotic or episcleral tissue. It is not improbable that the inflammation may travel along the loose tissue between the dural and pial optic-nerve sheaths, but it is to be remembered that the inflammation of this is usually extremely slight compared with that of the uveal tract itself; and that sympathetic inflammation may occur, without any implication of the choroid, in the neighborhood of the papilla of the eye." The pathological changes which he notes are infiltration of the iris, the ciliary body, and choroid with lymphoid cells. There is infiltration in and around the walls of the retinal blood-vessels, especially upon the papilla. Optic neuritis is present, and also inflammation, which may be considerable or extremely slight in the intervaginal space of the optic nerve.

If an eye is suffering from sympathetic irritation only, and there are no evidences of plastic iritis, it would certainly be good practice to enucleate the injured eye, providing it is blind or so severely injured that it is likely soon to become so. We then place our patient on safe ground. If, however, the period of irritation is past, and we have to do with a plastic or serous iritis, we should delay the enucleation until all inflammatory symptoms have subsided. There may be exceptions to this rule in severely injured eyes with prolapse of the iris, or when it is quite probable that the foreign body is still in the eye. In Mr. N.'s case it would have been useless to have enucleated the injured eye at the time of his second visit. The result shows that it would have been unjustifiable, for he now sees enough to walk around with it, and I feel confident that in a few months the media will so far clear up as to give him considerably better vision.

The case reported by me in vol. v of these ARCHIVES, page 226, is another instance of the same kind. Here the sympathetically affected eye became practically useless, but the injured eye became a useful organ. His vision was $\frac{1}{8}$ when he left, and no unfavorable report has since been received. I had another case of rupture of the sclerotic a few

years ago, in the Cincinnati Hospital, which bears on this point. The patient's right eye had been blind for several years, but the left one was good up to the time of the injury. One night, going out of the house in the dark, he stumbled and fell on the corner of a small pine box and produced an extensive rupture of the sclerotic of the left eye. The rupture was upward, and bulged unusually from the blood which immediately filled the ball. He had pain for a few days, but it subsided, under the use of cold applications. He remained several weeks in the ward, but had only perception of light in the eye when he was transferred to the City Infirmary as a blind man. I did not see him until more than a year afterward, when, to my surprise, he walked into the office. I found that the scleral rent had closed, and that the media were clear, and that the optic disc could be seen. It appeared paler than normal, and was distorted from the deviation in the curvature of the cornea. With $+ 14 D = Ah 6 D$ ang. o, he could spell 20 Sn and of course could walk around comfortably. Here is a case where there seemed absolutely no chance for the injured eye. The clot was several months in clearing up, but just how long could not be determined. These cases are at least an encouragement to preserve an eye suffering from rupture of the sclerotic, providing that it is seen after the sympathetic symptoms have set in. Could it not also be an argument in favor of the early excision of an eye so severely injured? This would depend on the per cent. of such cases followed by sympathetic symptoms. In Mr. N.'s case we depended on him as an intelligent man to return upon the first evidences of sympathetic irritation, but he waited to try some home remedies first.

The profession is greatly indebted to Professor Mauthner, of Vienna, for his valuable work on sympathetic ophthalmia. He discusses the subject in a vigorous manner from a standpoint of close clinical observation, and his deductions are rational and fully substantiated. In speaking of the influence of the ciliary and optic nerves he says, "that there is not the least doubt that the sympathetic inflammation may frequently be transmitted along both paths at once, or at inter-

vals, so that many symptoms in sympathetic affections of the uveal tract (amongst others the functional disturbances) are not to be attributed to the inflammation of the uveal tract, but to a simultaneous inflammation of both retina and optic nerve." It is his opinion that an iritis serosa can be transformed into an iritis maligna by the operation of enucleation of the other eye. He has frequently observed that a simple plastic iritis which would have passed off as a mild attack is converted into an irido-cyclitis after the enucleation.

We may safely say that there are at least two things definitely settled with regard to the treatment of sympathetic inflammation. One is that the enucleation of the injured eye does not arrest or shorten the course of the disease, and the other is that an iridectomy should not be made until all symptoms of inflammation had entirely disappeared. In two of the cases reported in vol. 5, iridectomies were done, but they not only did not check the trouble but probably aggravated it. If they had been treated with poultices it is possible, if not probable, that some vision might have been retained. The beneficial effects of poultices in iritis, cyclitis, non-sympathetic irido-cyclitis, interstitial keratitis, etc., serve as an excellent argument for their use in sympathetic troubles. The above cases are not the only ones where they have been successfully used, but they are typical ones.

TWO CASES OF HEMI-ACHROMATOPSIA.

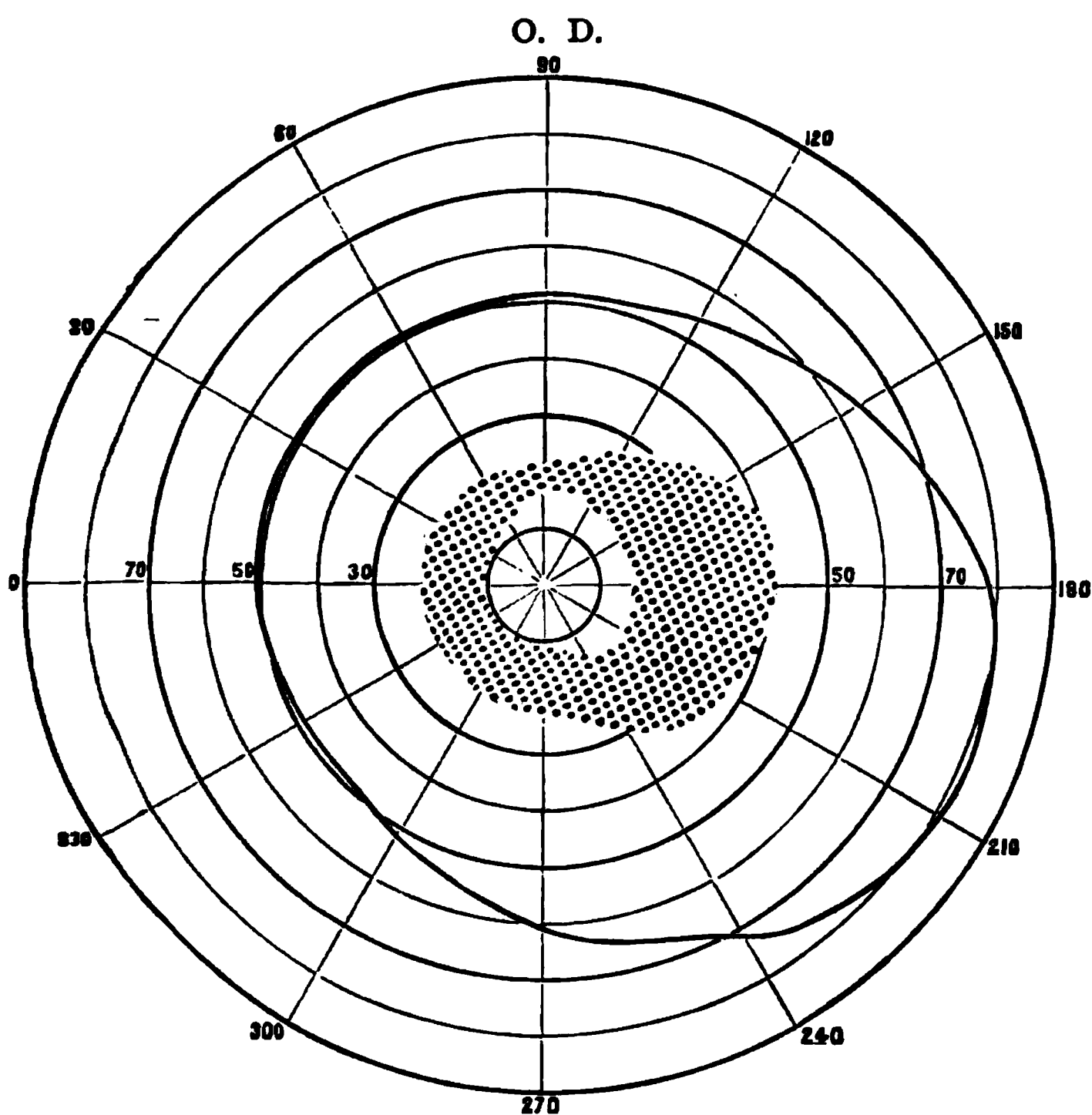
By HENRY D. NOYES, M.D., NEW YORK.

(*With six wood-cuts.*)

IN *Graefe's Archiv für Ophthalmologie*, Bd. xxvii, Abth. ii, S. 1-24, is an article by Steffan, which narrates an indisputable case of acquired color-blindness of both eyes, with retention of ordinary light-perception and of normal acuity of vision. One inference which he draws from the case, is that a separate centre must exist in the brain for the perception of color, and that it is independent of light-perception and of form-sense. In the Transactions of the International Ophthalmological Congress, at London, for 1881, is a remark, on page 61, by Prof. Dor, of Lyons, that he believed "that the seat of color-perception is in the brain, and not either in the eye or the peripheral parts of the optic nerve." His inference was derived from the asserted or supposed centric cause in the cases of loss of sight in which color-perception was found to be impaired. The two following cases had been seen, and the inference deduced from them, that there may be a separate centre in the brain for color-perception, before the above-mentioned statements had fallen under the writer's notice: further study of these cases leaves this theory in a more doubtful position.

CASE 1.—Dr. W. O. S., aged 41, of Lexington, Ky., came to me Jan. 30. 1882. He is a man of very active temperament, and slender figure; has been disposed to insomnia since childhood, and seldom sleeps longer than six hours. Has practised medicine

since 1865, and been excessively occupied. He lectures on chemistry, teaches private students, and conducts a large private practice. He has had indigestion and neuralgic pains in lower limbs, which he thinks were connected with constipation. A few months ago he found the sight of one eye impaired, and consulted various physicians, viz.: Dr. Cheatham, of Lexington, Ky.; Drs. Williams and Ayres, of Cincinnati; Dr. Thomson and Dr. Weir Mitchell, of Philadelphia; Drs. Knapp and Agnew, of New York. He desired advice both because of the defect of sight, and because of general depreciation of health. He had taken strychnia hypodermically and



Over the dotted zone blue is recognized. In all other parts there is no color-perception.

found that its use would improve vision in about fifteen minutes, and the gain would last three or four hours. He says that his sight is better than it was a month ago, both in acuity and in the extent of the fields. My inquiries could not elicit any distinctive symptoms beyond the above statements. He had had no head-

ache or other local disturbances. But he was a typical illustration of what is called an intensely nervous man ; one whose mental and nervous energy is being constantly and vigorously put forth : his speech is rapid, his movements quick, he was always alert. In the right eye vision was $\frac{20}{100}$. In viewing a long black line upon a white ground he observed transverse breaks in it of white spaces, which always preserved the same relative positions to each other. In the left eye $V = \frac{3}{8}$. By ophthalmoscope each optic nerve showed an extremely large central, so-called physiological excavation, which at once led me to feel the tension of the globe, which was normal. The tissue of the nerves was whitish, or indicated atrophy. No other lesions in the fundus.

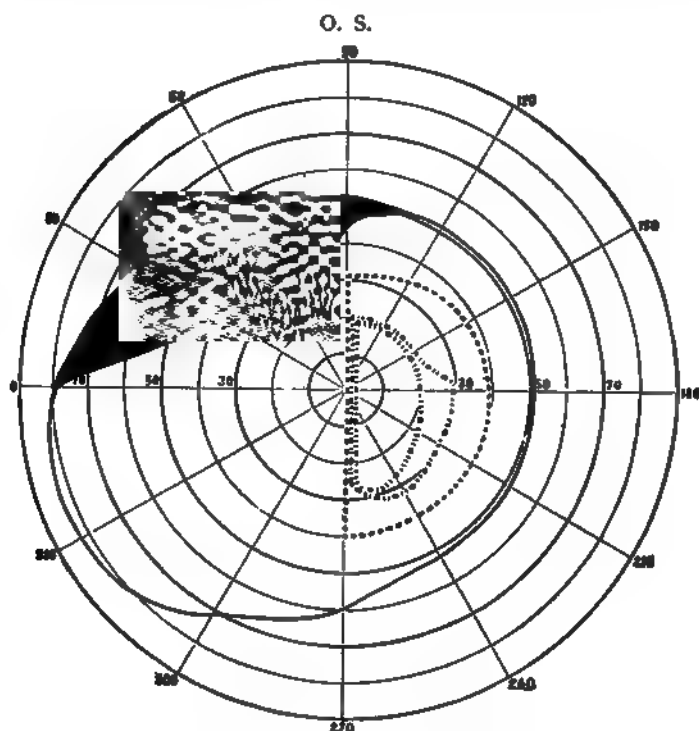
The visual fields, tested by Förster's perimeter, were as follows. (See diagram O. D.) The extent was normal. The perception of color is limited to the recognition of blue over the annular zone, indicated by the dotted surface. For a circular space at the centre there was absolute color scotoma, and beyond the border of the blue zone no color could be seen. In the space between 210° and 240° , and about the latitude of 40° , he sometimes seemed to discern red, but would also confound it with green. But it was in a very limited region that this sensation could be excited.

O. S. The visual field has a peripheral limitation on the upper and outer side, as shown in the diagram. The perception of light in all other parts is normal. The perception of color is absolutely wanting in the outer (temporal) half of the field, and the line of demarcation runs vertically through the macula lutea. On the nasal half the color-perception is normal, and the zones of green, red, and blue have about their usual extent and relations.

The discovery of this peculiarity in the color-sense of the left eye was new to Dr. S., and he appreciated its remarkable character. He did not know that he had any defects of this kind. Although in each eye there was deep excavation of the optic nerve, there was no sign of glaucoma, no increase of tension, no eclipses of sight, no sluggishness of the pupils, etc. In both eyes the ophthalmoscopic appearances were alike. The eye which was half color-blind had $V = \frac{3}{8}$; the other eye with central color scotoma, and a zone where only blue could be seen, had $V = \frac{20}{100}$.

P. S. Since the above notes were taken, and while the proof of this article was being corrected, I saw Dr. S., on May 26, 1882. His condition has improved both in general health and in vision. He has less dyspepsia and less of the neuralgic

pains which have always been common. To these he has always attached slight significance; he denies that they are lancinating, and regards them as having a gastric origin from dyspepsia. The question of lesion of the spinal cord has been raised when he has been examined by physicians, and by at least one eminent neurologist it was decided emphatically in the negative before I first saw Dr. S. Other physicians have believed that there is such a lesion.



The outer dotted line is the limit for blue.
 " middle " " " " " red.
 " inner " " " " " green.

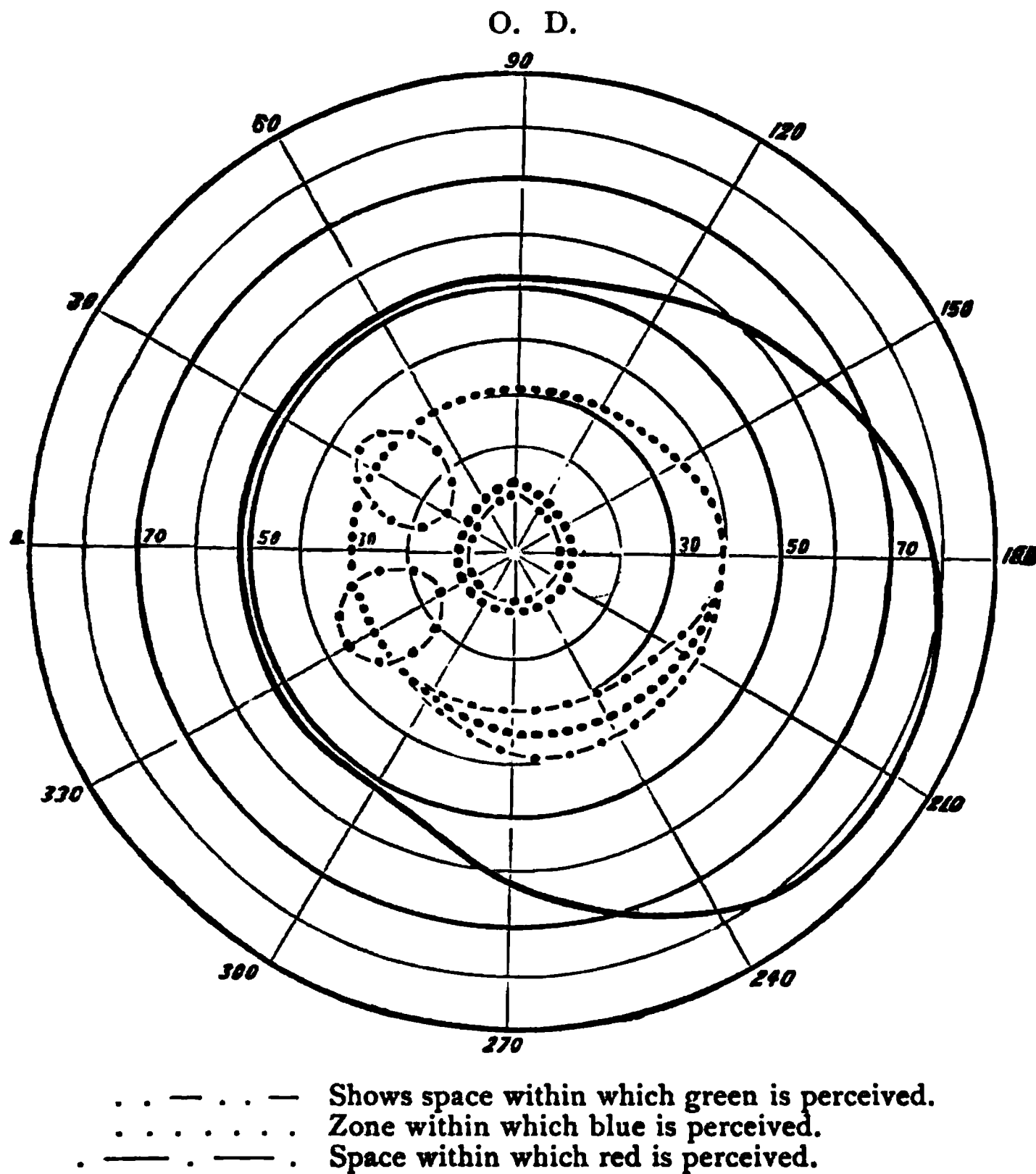
At present I find he has the so-called Robertson pupils distinctly marked—*i. e.*, they are habitually small and will not contract under bright light, but promptly contract and to a very small size under efforts of accommodation, and also contract in less degree upon ordinary movements of the globe. This symptom was also noted by Dr. Knapp and mentioned by him in a note to me. His neuralgic pains run down the crests of the iliac bones and the thighs, and

are aggravated by constipation. The optic nerves are whiter and more decidedly atrophic in appearance than they were four months ago. His acuity of vision he says has improved; he also says that in the eye which had hemianopia for color (the left) the color-perception has returned over a part of the half formerly deficient; in the other eye, which had only a limited zonular field for blue, that now green is visible on the centre, and red can be seen over small areas in some situations. These statements as to his vision I could not verify, nor could I make by actual testing another map of his visual fields, because he was pressed for time in getting ready for a trip to Europe. He had become extremely familiar with his visual symptoms, and expert in laying out the peculiarities in color-perception on a chart. On the whole, the aspect of his case inclines much more, in my opinion, than it did four months ago to the probability of there being a lesion of the spinal cord, notwithstanding the absence of ataxic symptoms.

The following charts (see pages 215 and 216) are made from Dr. S's own description, illustrated by diagrams also drawn by himself. They explain themselves, and it will be necessary only to refer to several points not heretofore mentioned, which were examined, though not in a very critical manner. In the left eye, the form-sense was much less acute in the supero-temporal quadrant than in other parts of the field—it was reduced to $\frac{1}{10}$ at 15° from the point of fixation—whereas the normal acuity existed in other portions, namely: this degree of vision at about 50° from the centre. This quadrant shows limitation of the V F and color-perception, as indicated by the chart. The form-sense in the peripheral parts of the right visual field was not reduced, while the central vision was about one fifth.

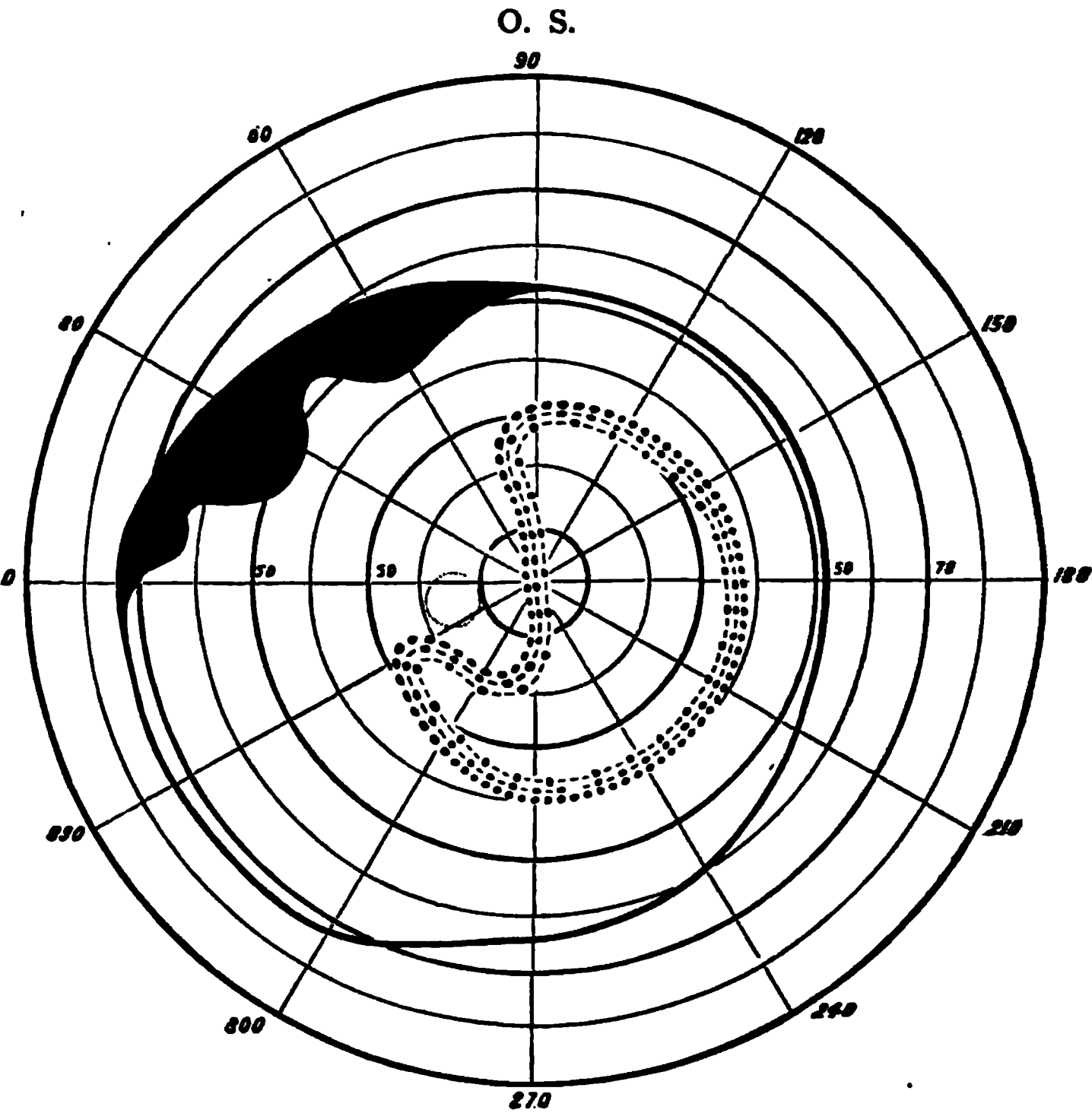
CASE 2.—Mr. C. C., æt. 60; examined February 1, 1882. Twelve years ago sight began to fail in both eyes, and within three months was reduced to very nearly the condition in which it is now. It has continued steadily in this state without variation, as he asserted with positiveness. There has been no pain, nor phosphenes, nor obscurations. Pupils respond to light, but act sluggishly in dim light. The left is smaller than the right. The fixation of the left eye is indirect, its axis turning upward. Tension in both eyes about normal, although it seemed to be a little plus

O. D. V = $\frac{10}{800}$; O. S. V = $\frac{6}{800}$. By ophthalmoscope, media clear; refraction emmetropic. Optic nerves in both eyes deeply excavated; the vessels displaced to the nasal side and concealed under the brim of the disc; on the temporal side the excavation slopes gradually up to the edge. The surface is bluish white, not mottled. Slight pressure evokes pulsation of the vessels. They are all



small, and on the surface of the nerves almost none are to be seen. The ophthalmoscopic appearances are by some interpreted as indicating glaucoma simplex, while the predominant factor in the case is evidently atrophy of the nerve tissue. There is no other lesion. There have been no head symptoms nor indications of disease of the spinal cord except that the patellar reflex is absent. The visual fields are as follows: O. D. No limitation in light-per-

ception. In color-sense the nasal side is absent, and the line of division is vertical through the macula lutea. The temporal side

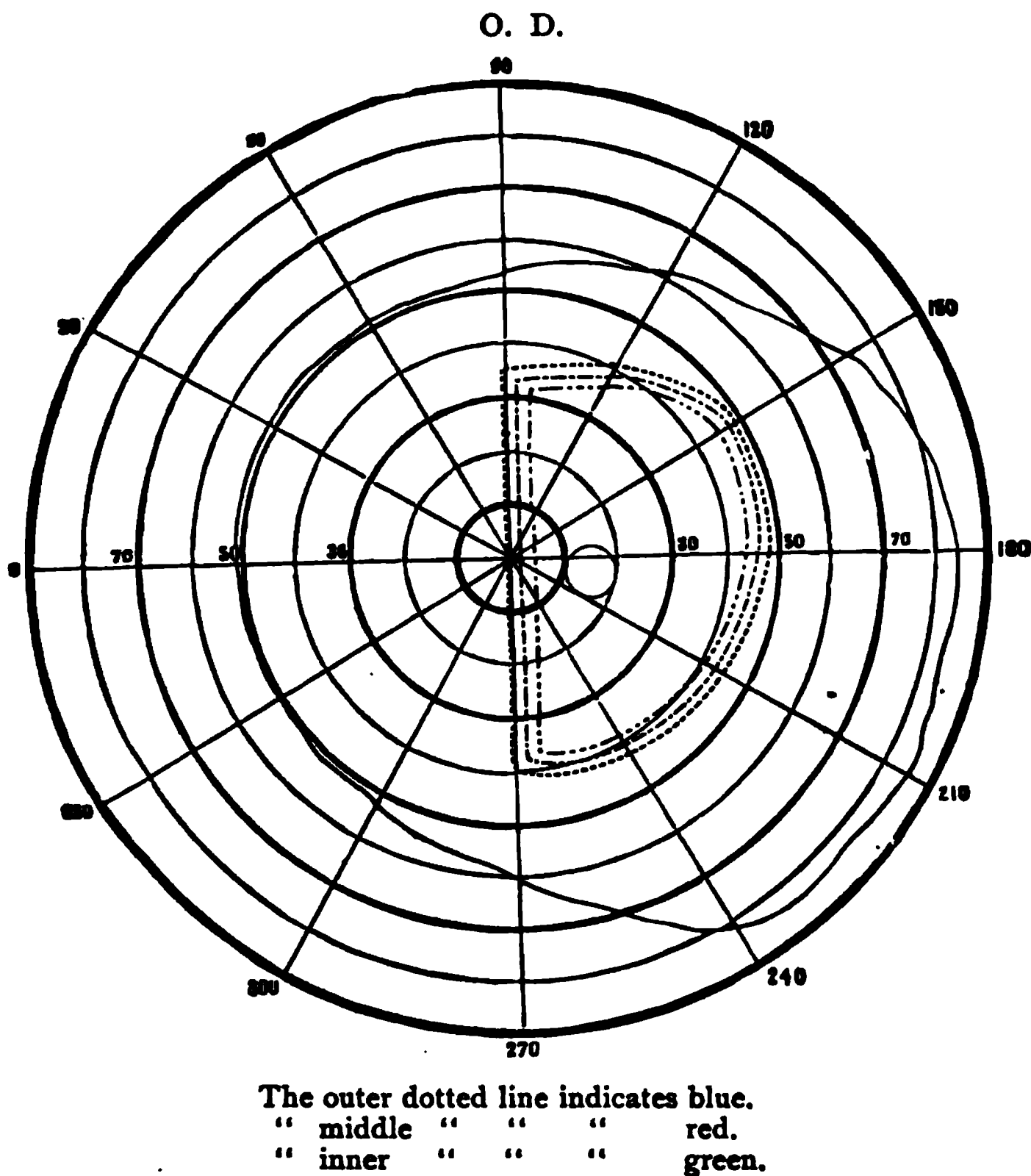


The dotted lines show the limits of
 blue.
 . — . — . — red.
 . — — . — — green.

is sensitive to color ; green, red, and blue are perceived over about an equal area, viz., to about 50°.

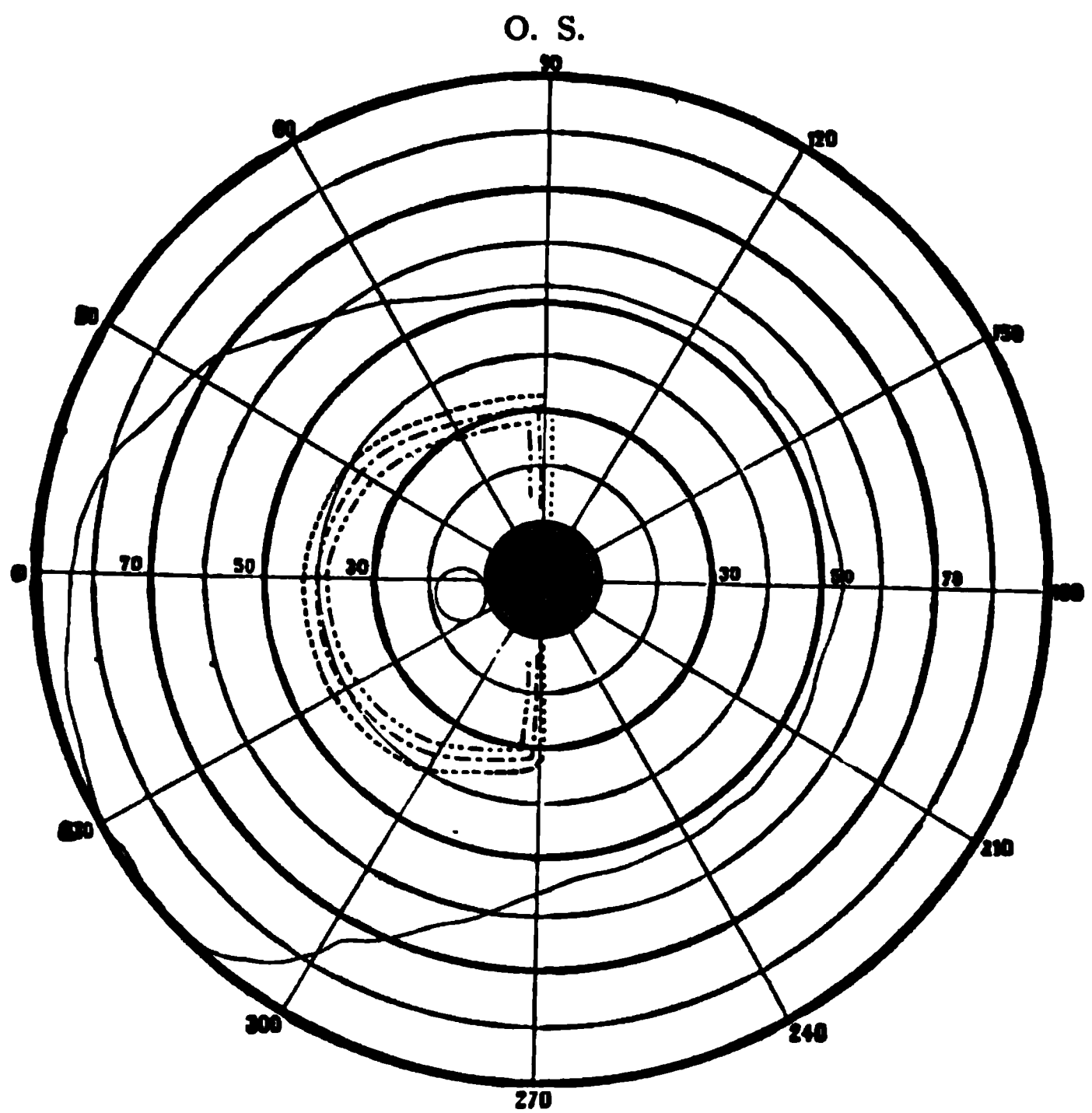
O. S. No peripheral limitation of field, but there is an absolute circular scotoma at the centre, of precisely 10° in diameter ; here also there is no light-perception. Color-perception is wanting on the nasal side, and the line of division is on the vertical meridian. On the temporal side color is recognized to 40°, and for about equal areas for green, red, and blue. The case therefore shows normal fields in peripheral extent for light—and leaving out the central scotoma of the left eye, there is bilateral nasal hemi-anopsia for color—or bilateral nasal hemi-achromatopsia.

Remarks.—As already remarked a case of acquired color-blindness without injury to visual acuity or impairment of fields is reported at length by Steffan, see *Graefe's Archiv*, xxvii, ii, pp. 1-24, and he discusses, with much completeness, the subject of where the seat of color-perception is to be located. His patient was totally blind to green, and possessed very dim perception of red, yellow, and blue. He was affected in both eyes, and the cause was cerebral, and from the symptoms he, presumably, had apoplexy.



Samelsohn, see *Centralblatt für die med. Wissenschaften*, Nov. 19, 1881, No. 47, p. 850, records a case of hemiopic color-blindness without injury to visual acuity, affecting homonymous halves of both visual fields. This too was of

cerebral origin, and there was partial paralysis of the right arm and leg without loss of sensibility, and slight paresis of the right rectus superior muscle: all of which symptoms indicated apoplexy. He was examined by Samelsohn three months after the attack, and the ophthalmoscopic appearances were normal. In both eyes $V = \frac{1}{2}$; the visual fields tested by a white object were normal in extent, but on the left half of each field there was total blindness to all colors. The color-blindness and the paralysis were therefore in harmony as to the side of the brain implicated.



The outer dotted line indicates blue.
 " middle " " " red.
 " inner " " " green.

These two cases, especially the latter one, seem to point forcibly to the existence in the brain of a color-centre in each hemisphere, distinct from the light-centre. There

are three cases quoted by Steffan, *l. c.*, p. 8, in which with homonymous hemianopia of the usual type there was total blindness for color over all of both fields. These cases, being the counterpart of Samelsohn's, might be interpreted as showing that the hypothetical color-centres of both hemispheres had been destroyed, while in only one hemisphere had the light-centre been damaged. But in these cases the history of the lesion indicates that it must have happened near the base of the skull, and removes the seat of injury from the hemispheres to some portion of the tractus or their continuation.

In the cases which I present there are no discoverable signs of brain lesion. In the first it was evident that the patient was suffering from cerebral exhaustion and over-activity. He had been carefully examined by neurologists and no disease of the brain discovered. By the ophthalmoscope it is true that an inordinately large excavation of each optic nerve was discovered—and this was of the kind which has been considered physiological, although the appearances were those of atrophy and at the most recent examination had decisively this character—notwithstanding in one eye the vision was 1. The symptoms pointing to probable lesion of the cord have been referred to in the postscript to the case. In the left eye, whose acuity was perfect, there was a small invasion of the field of light-perception at the periphery, and in the same eye there was on that side of the field total color-hemianopia. The other eye had a complete visual field for light-perception, with reduced vision, viz., $\frac{20}{100}$, and absence, in all parts, of color-sense, saving over a zone where only blue was seen, and some vague recognition of red over a small spot. The color-lesion of the left eye might be referred to a hypothetical cortical centre of the right hemisphere, or perhaps to some part of its tractus. But the color-lesion of the right eye must evidently be located in front of the chiasm, and be assigned to its optic nerve. While in this case the hemianopic features of the left eye suggest a lesion behind the chiasm, the quality of the field in the right eye points with extreme probability to the nerve as the seat of lesion.

In it we may assume either an impairment in the color-perception or of the conductivity of color-perception according to the structures to which we impute the original faculty of recognizing color—whether in the retina or in the nerve fibres.

In Case 2, there is a striking and symmetrical hemianopia for color, but the facts are even more incompatible with our theories than in the one preceding. It is the nasal halves of the color-fields which are deficient, and to bring them within the influence of a lesion of the brain or of the tractus, it is necessary to assume an exactly similar lesion of each cortical centre or of each tractus on its outer side—a supposition which is in a high degree improbable. If this be laid aside we must invoke a double symmetrical lesion in each optic nerve or in each retina. It must be remembered that each eye showed deep excavation of the optic nerve of glaucomatous type, and the case had by good observers been pronounced glaucoma. I myself, while willing to discuss the opinion, incline to regard nerve atrophy as the essential factor. Where, however, in this case is the origin of the sense of color to be placed? We may make the supposition that the optic-nerve fibres are capable of undergoing an alteration by which they lose the power of transmitting color-sensations, but do not lose the power of transmitting luminous sensations. This is really the fact in central color-scotoma. But even this hypothesis would not help us solve the difficulty, which arises from the symmetrical character and the necessarily double nature of the cause.

The question raised is whether the cerebral centre for color is to be located coincident with or separate from the centre for light. The physiological chain may still be considered analogous to that of other sensations, as of sound, or smell, or touch, viz.: that a peripheral organism, the retina, is the place where the peculiar reaction and impression of color is made; this reaction is conveyed along the optic nerve and tractus, and is taken cognizance of by the proper part of the brain. In other words, as with smell, we have perception, conduction, cognizance (or conception).

In the case of sound the last act is divisible into the cognizance of spoken sounds (speech), of noise, and of musical tones; and recent studies have shown that a separate centre may preside over each of these subdivisions of audition. The question is whether in vision it will turn out that a similar subdivision is to be assumed. The cases which I contribute seem to me to be calculated to bring confusion rather than clearness into the inquiry. In the first case, the partial return of the color-perception in the eye which was for a time hemianopic for color, may not invalidate a claim on behalf of a possible cerebral color-centre, because it is, of course, proper to assume that a better nutrition had begun to occur in the previously damaged tissue of the brain. Nor need the theory that in this case the spinal cord may be involved be regarded as an insurmountable objection, because we have only to suppose that the damaged fibres of the cord have passed through or mingled with the brain locality for color-sense, or with some part of the tractus on its way to that locality, and thereby accomplished indirectly the same mischief which was observed by Samelsohn in his case as the direct result of a lesion.

In the second case the necessity of supposing a perfectly symmetrical double lesion seems to me to make a very difficult obstacle in the way of a cerebral localization for color, and hardly less difficult in ascribing the mischief primarily to the retinae, while only at the chiasm or along each tractus can we locate the trouble which is the impediment to color-perception in each nasal half of the fields.

FOREIGN BODIES TOLERATED IN THE BACK-
GROUND OF THE EYE, WITH PRESERVA-
TION OF GOOD SIGHT.

By H. KNAPP.

(*With two wood-cuts.*)

THE observations of foreign bodies, which have pierced the walls of the eye and remained embedded in the retina without producing material injury, are still rare, yet the cases, so far as they have come to my notice, have so many striking features in common, as to be almost sufficient for a general description of the occurrence and consequences of this traumatism. Though in the great majority of instances foreign bodies which penetrate into the interior of an eye entail its ruin, and too frequently even that of its fellow, they are occasionally met with situated harmless in every part of the globe. Twelve cases are on record where they have lain innocently in the retina without great, or even without any, impairment of central vision.

The first publications were made by A. v. Graefe, in 1857 (his *Archives*, vol. iii, p. 347, etc.). He relates *three* cases in which small pieces of metal penetrated the capsule of the eye, reached the inner membranes, and remained on them, not encapsuled, but free, causing hemorrhages and transient opacities of the vitreous, yet no detachment of the retina or vitreous, leaving local destruction of the retina, irregular choroidal pigmentation, a corresponding scotoma, but otherwise useful sight, and no protracted irritation.

The *fourth* case is by Jacobson, 1865 (*Graefe's Arch.*, vol. ix, No. 1, p. 129, etc.). A small piece of stone penetrated the cornea and lens, produced cataract, which was successfully removed by linear extraction. Later the vitreous clear throughout; the foreign body near the optic disc, one end in the sclerotic, the other free; in choroid and retina a rupture with widely gaping edges; a corresponding defect in the visual field. S $\frac{1}{8}$.

The *fifth* case is by Jacobi, 1868 (*Graefe's Arch.*, vol. xi, No. 1, p. 938, etc.). A chip of iron, 0.75 mm. broad, with its sharp end in the retina, its broad end free in the vitreous, was encapsuled; had a dark contour from remnants of ecchymoses and hypertrophy of choroidal pigment. Lens intact; a thread in vitreous indicated the course of the foreign body. Defect in F. V = 1.

The *sixth* case is by Hirschberg, 1874 (*Klin. Beobachtungen*, p. 103). A fragment of metal passed through cornea, iris, lens, and vitreous, stuck in the retina, about 9 PP. distant from the optic disc, was perfectly black, oval, not prominent, not encapsuled, but surrounded by a white border. Vision at first good, a year later reduced to $\frac{2}{500}$ on account of progressed opacity of lens.

The *seventh* case is likewise by Hirschberg, 1875 (*Berl., klin. Woch.*, 1875, p. 300). A chip of iron in the fundus oculi, one end free in the vitreous, black, surrounded by a bright white zone. Circumscribed scotoma. V, Sn $1\frac{1}{2}$ at 7', eight months later.

The *eighth* case is reported by G. Strawbridge, 1878 (*Trans. Am. Ophthal. Soc.*, vol. ii, p. 305). An iron splinter the size of a pin-head had penetrated the sclerotic near the tendon of the internal rectus and lodged in the sclerotic slightly outward and downward from the papilla. It was surrounded by a large white circular space, evidently the bare sclerotic, around which the choroid was degenerated. The vitreous was full of floating opacities. V = $\frac{2}{100}$. A marked defect in the centre of the visual field. No irritation in either eye. Observation 2 years.

The *ninth* case is by O. Sigel, 1876 ("On Foreign Bodies in the Posterior Segment of the Eye," *Inaug. Dis. Tübingen*,

and Naegel's *Jahresbericht*, pro. 1876, p. 544). A fragment of a gun-cap was located in the region of the yellow spot. The irritation of the eye ceased in a few days. S $\frac{5}{18}$. Defect of F. near point of fixation. Observed several months, no change.

Tenth case. Dr. Brière, 1877 (*Annal d'Ocul.*, tome 78, p. 42), discovered with the ophthalmoscope a small splinter of steel, fixed at the lower and outer part of the retina, surrounded by a white exudation of 3 or 4 mm. in extent three days after it had entered the eye. The patient, feeling no inconvenience and seeing well, did not follow the doctor's instructions to remain in a darkened room and keep the eye as absolutely quiet as possible, but went about his business, until 5 days later an acute attack of severe irido-choroiditis set in which was treated with iced compresses, and subsided in two weeks. With the ophthalmoscope a white mass as large as a pea, the uncapsuled foreign body, was seen at the lower part of the vitreous. Complete recovery. A year later a considerable defect in the upper part of the visual field. S $\frac{3}{8}$.

The *eleventh* case is by S. Snell, of Birmingham, 1878 (*Lond. Ophth. Hosp. Rep.*, vol. ix, p. 370). A small piece of steel entered through the sclerotic, is on retina, near optic disc, lying on the artery and vein, black, "with a little white patch of atrophy upon it." Reads J. 1; sees as well with this eye as with the other.

The *twelfth* and last case is by Hirschberg again, and published in these ARCHIVES, 1880 (vol. ix, Germ. ed., p. 309, Eng. ed., p. 386, etc.). Splinter of iron entered through sclerotic, situated in retina, near od., one end free, projecting 0.6–0.75 mm. in vitreous, black, surrounded by a snowy white border of connective tissue, which also partially covers its free surface. Small scotoma. V $\frac{15}{200}$.

To these observations the following by the present writer may be added as the *thirteenth* case:

Chip of iron passed through cornea, iris, lens, and vitreous; one end situated in the retina, the other free in the vitreous; circumscribed scotoma, vision $\frac{3}{8}$. Eye free from irritation; observed 10 weeks.

Mr. John Tr., æt. 29, machinist, of New York, was hammering a piece of steel March 9, 1882, when a small fragment struck his eye. The vision was clouded at once, and black dots appeared to float before the eye. There was very little pain. The next day he presented himself to me at the dispensary. I found lachrymation, slight circumcorneal injection, a linear opacity of 2 or 3 *mm.* in extent in the lower-outer part of the cornea, about midway between the centre and the periphery ; directly behind it the iris tissue swollen, without any perceptible perforation ; the pupil narrow ; the media turbid, affording only an indistinct view of the fundus. The pupil did not dilate fully by atropia, and the lower-inner part of its edge adhered to the capsule. The lens was somewhat dull in its lower-outer part. Vision impaired ; field, tested with the hand, normal. My opinion was that a chip of iron was in the eye, though I could not determine its location. The patient was advised to instil atropia into his eye and remain at home in a darkened room for a few days, if his eye did not become worse.

He did not return until 3 weeks later. The eye was free from irritation, the little corneal scar was distinct, the adhesion of the iris was in the same place ; an opaque streak passed through the outer-lower part of the lens, and broadened irregularly at the posterior capsule. The remainder of the lens was clear, the vitreous turbid. When the pupil was kept illuminated and the patient was asked to move the eye in different directions, a bright spark seemed occasionally to flit across the red field. The fundus could be well enough seen to recognize its details. The od. was normal, and so was the remainder of the fundus, with one exception : a short distance below and temporally from the macula lutea there was a black oval spot, surrounded by a bright white band, and showing in its centre a sharp ridge of metallic lustre. Tn. V $\frac{2}{10}$, that of the other eye $\frac{3}{10}$. The diagnosis of the chip of iron in the retina being ascertained, and no irritation being present, the patient was advised to continue the atropia instillations, to be careful, and return in a few days for a perimetric examination. He did not return until six weeks later, when the previous condition was found unchanged, except that the vitreous had cleared up. An examination on the day of the present writing, May 21, '82, ten weeks after the injury, discovered the following condition:

The corneal scar, 3 *mm.* in extent, is well visible ; opposite it, in the lower-outer part, the iris tissue is puckered and shows an irregularly depressed scar of 2 or 3 *mm.* in length. A gray streak

runs from this place directly backward through the lens, which appears clear in all its other parts. By ophthalmoscopic illumination, however, the posterior end of the streak is seen to broaden into an irregularly dotted patch, the central limit of which reaches near the posterior pole of the lens.

The vitreous is somewhat diffusely opaque, free from all cords and flakes. The optic disc and background of the eye are normal, with the exception of the seat of the foreign body. In the inverted image the foreign body appears a little above the yellow spot and toward the nose of the patient (see accompanying drawing, fig. 1). It is black, and surrounded by a perfectly white band.

FIG. 1.

Its vertical dimension is almost equal to the diameter of the optic disc, its breadth about $\frac{3}{4} P$. The surrounding retina appears normal, except that the upper border of the splinter is capped with a small crescentic whitish patch. The choroid near its lower nasal border (always the inverted image) is superficially atrophic in a small area. The retinal vessels are not disturbed by the foreign body; a thicker arterial branch is covered by it, and has no irregularities on either side.

The erect image shows the horizontal blood-vessels distinct with $+\frac{1}{4}P$, and the crest of the foreign body with $+\frac{1}{2}P$, which indicates a projection of the foreign body over the level of the retina of almost 1 mm. The crest of the foreign body appears in the erect image as a sharp line, here and there very lustrous, and

traversed by fine whitish filaments, which are in connection with the white border. The temporal surface of the crest slopes gently down, while the nasal border falls more abruptly. The foreign body is entirely immovable.

Concerning the outward appearance of the eye, I may mention that its size, motion, and tension were normal. S was $\frac{3}{8}$. With $+\frac{1}{4}$ it was $\frac{3}{8}$, with $+\frac{1}{8} + \frac{1}{8}$ axis 90° (vertical) it was $\frac{3}{8}$. No. 0.3 was read with $+\frac{1}{8} + \frac{1}{8}$ 90° at 10" (under atropia).

The field of vision, perimetrically determined, gave a well-marked scotoma, corresponding in location to the ophthalmoscopic picture of the foreign body, but exceeding it in size. The answers of the patient were quite distinct, and repeated examinations showed the same limits. In the horizontal meridian it extended from 9° to 28° , in the vertical from 10° below the horizon to 22° above, on the nasal side of the point of fixation (see fig. 2).

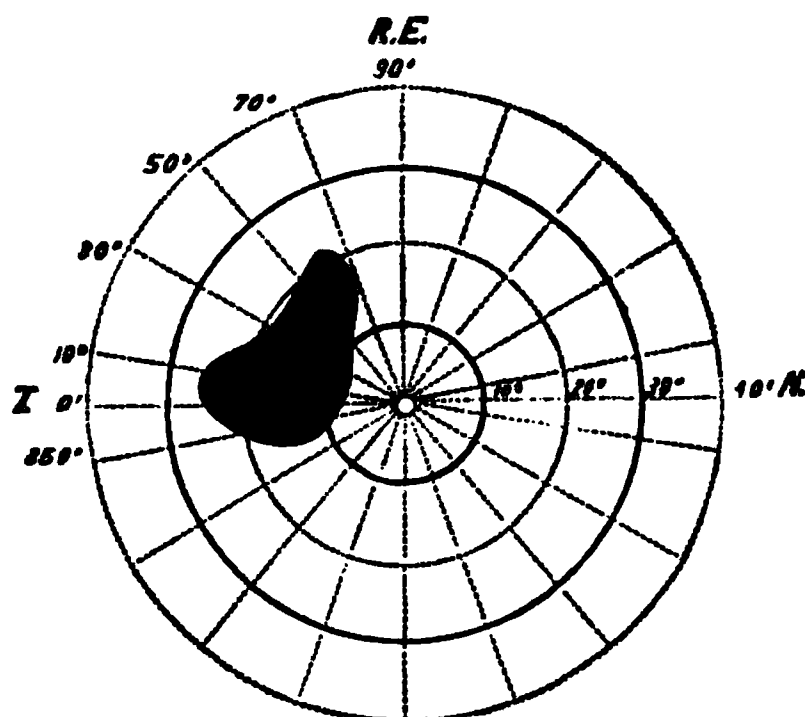


FIG. 2.

Another case occurred at the N. Y. Ophthalmic and Aural Institute during my absence in the summer of 1877. It was under the care of Dr. E. Grüning, and embodied by Dr. E. Fridenberg, at the time House Surgeon to the institute, into his (unpublished) inaugural thesis. The injury was followed by moderate irritation and cataract, which was successfully removed by Dr. Grüning. After the recovery the foreign body was noticed in the retina. Upon inquiry, Dr. Fridenberg was kind enough to write me yesterday, that "the foreign body can still be seen embedded in the retina near the papilla. The aphakial eye sees $\frac{\infty}{xx}$ with proper glasses. A slight degree of strabismus divergence, but no symptoms of irritation can be seen at present." I hope that Dr. Grüning or Dr. Fridenberg will favor us with a detailed account of this case.

COMPREHENSIVE REMARKS.

The conditions under which foreign bodies in the background of the eye are tolerated, may be ascertained in two ways: first, by clinical observation; second, by experiment. Leaving, for the present, the way of experiment aside, I will try, by reviewing the clinical material at our disposal, to enumerate the conditions under which foreign bodies have been observed to be tolerated in the background of the eye.

1. *The size of the foreign body did, with one exception, not exceed 2 mm. in its greatest diameter.* In Graefe's first and second cases it was about as long as the diameter of the optic disc and scarcely half so broad. In Jacobson's case the corneal scar was, 1½ hours after the injury, about 1''' long, the ophthalmoscopic dimensions are not stated—"a small dark body was seen." * * * In Jacobi's case the thickness was 0.75 mm., the length could not be determined, as it was impossible to know how deep it penetrated into the membranes. In Hirschberg's first case the corneal scar, three days after the injury, was, 1''' long; the body, ophthalmoscopically determined, was about 2 mm. long: in his second case it was 2 mm. long and 1.5 mm. broad. In Strawbridge's case it had the size of a pin-head. In Snell's case it was about 1.25 mm. long and 0.75 broad. In Hirschberg's third case it was about 1 mm. long and 0.50 mm. broad. In our case it was 1.5 mm. long and 1 mm. broad. The foreign body in Graefe's third case was exceptionally large, "at least 2½''' long and 1''' broad. It produced an irregular corneal scar of 1''' in length, and must have pierced the cornea in the direction of its longest diameter."

2. *The substance of the foreign body was iron or steel in all cases except two:* that of Jacobson, in which a miller, while sharpening a mill-stone, injured his eye by a piece of stone flying off, and that of Brière, in which it was copper, a fragment of a gun-cap.

3. *The parts traversed by the foreign body were the cornea, iris, and lens in the majority of cases; the sclerotic, ciliary body, and choroid in some; the vitreous, of course, in all.*

4. *The reaction of these parts, produced by the traumatism, was a readily cicatrizing wound in the cornea and sclerotic;*

perforation and cicatrization, with or without transient inflammation, in the *iris*; stationary or progressive opacity in the *lens*, necessitating the subsequent extraction of cataract; diffuse and floating opacities in the *vitreous*, clearing up in most cases, partially remaining permanent in some.

5. The *lesions in the fundus were circumscribed laceration of the retina and choroid*, and hemorrhage; no detachment. In one case (Snell) the retina was intact, the foreign body adhering to its inner surface.

6. The *reaction in the membranes of the fundus was circumscribed thickening of the retina, circumscribed irregular pigmentation and superficial atrophy of the choroid*; in one case (Jacobi) hypertrophy of the choroidal pigment is mentioned, but, to judge from the black appearance of the foreign body in our and other cases, this is not beyond doubt. In all cases there was transient, more or less severe ophthalmitis.

7. The *foreign body was situated* in one case (Snell) on or in the inner layers of the retina; in the majority of cases it penetrated the whole thickness of the retina, in some the retina and choroid; in one it was said to stick in the sclerotic.

8. In most cases *one end of the foreign body projected into the vitreous*, up to 1 mm. or less in height; in some its inner surface was at the level of the retina. The inner end was either perfectly free, or incompletely covered with delicate cords of connective tissue, or the whole foreign body was encapsuled (Jacobi, Brière).

9. The *retinal border of the foreign body was surrounded by connective tissue*, which in some cases (Snell, for instance) was very scant; in others (Hirschberg's and ours, for instance) it formed a bright, white, tendon-like ring of characteristic appearance. This ring and the scanty cords arising from it seemed to be the main supports of the foreign body.

10. The *functional disturbances* consisted at first in obscuration of the visual field and impairment of vision, later in a permanent scotoma corresponding in location to the foreign body, but being mostly larger than could be expected from the ophthalmoscopically determined size of the foreign body or the lesion in the retina, because not

only the percipient elements of this spot, but also the nerve fibres passing through it, must have been destroyed. In one case (Snell) a defect in the visual field could not be detected, but, as Hirschberg remarks, it would have been found had the field been perimetrically examined.

The central acuteness of vision was more or less good in all cases; in some (Jacobi, Hirschberg, Snell, Grüning, and ours) it was normal.

As regards the DIAGNOSIS of the presence of such foreign bodies, we must try to detect their place of entrance in the ocular capsule, and carefully, persistently, and repeatedly search for them in the interior of the eye. A bright spark, which during the examination with transmitted light seems to flit across the red field, does not prove that the foreign body is floating in the vitreous. In our case this symptom first attracted my attention, and led me at once to find the location of the foreign body in the retina with the indirect method. We should not be contented with the simple detection of the foreign body, but carefully determine its locality, size, and projection into the vitreous humor. The determination of the central acuteness of sight and the perimetrical examination of the field of vision should, of course, not be omitted.

The PROGNOSIS, in a given recent case, will depend on the size and nature of the foreign body, the location and extent of the lesion made in the ocular capsule, iris, and lens. We should, however, not forget that the tolerance, even if once established, is not illimited, as the foreign body, after any number of years, may become loose and produce irritation, or without becoming loose, may produce repeated attacks of internal inflammation. A number of examples of the former condition is known, and the latter is strikingly illustrated by a case reported by G. Strawbridge (*Trans. Am. Ophth. Soc.*, vol. ii, p. 103), in which an iron splinter had passed through cornea, iris, and lens, and lodged in the sclerotic near the optic disc. "After a severe irido-choroiditis the eyeball remained quiet for three years; then a second attack occurred, lasting a short time, and was followed by a four years' interval of rest.

A third attack, of similar character, and a three years' interval of rest, were succeeded by chronic irido-cyclitis, which, on account of sympathetic irritation in the second eye, rendered the removal of the first necessary. The splinter was firmly embedded in the sclerotic, and the interior of the eyeball filled with the products of the previous inflammatory attacks."

As to TREATMENT, I would, in recent cases, try the removal of the foreign body by curved hooks, forceps, or the magnet only if it could be seen; otherwise I would let the patient quietly lie in bed on his back, use atropia, and bandage both eyes with absorbent cotton and a flannel roller, thus securing the best conditions for the foreign body to sink on the retina, in case it be floating in the vitreous, as well as to fasten itself on or in the retina if once it have reached that membrane.

Pathologically the cases in which a foreign body is tolerated in the background of the eye are of great interest. With one end these bodies are embedded in the membranes, with the other they project free into the vitreous. They enter the eye without any antiseptic precaution, and yet do not cause suppuration. If the tendency of the vitreous for idiopathic inflammation, as H. Pagenstecher and others have shown, is very slight, we might at least expect these extraneous substances to cause inflammation by irritating the retina and choroid.

Extended clinical observation is needed to show how far the cases of tolerance are the rule or the exception, how far the tolerance depends on the size and substance of the foreign body, and how far on the behavior of the patient, or on medical treatment.

Experiments on the reaction or non-reaction of foreign bodies in the eye, such as Th. Leber has instituted, are highly desirable. I would wish, however, that the investigators were not so predominantly governed by the current bacteriological ideas of the day,—the importance of which, as far as it goes, I willingly acknowledge,—but that they might vary the conditions of their experiments chiefly according to the requirements of practice and the principles of general pathology, of which parasitology forms only one chapter.

A FRAGMENT OF STEEL EMBEDDED IN THE CORNEA FOR TWO YEARS WITHOUT CAUSING IRRITATION.

By H. KNAPP.

AS an appendix to the foregoing paper, the following case may serve as an illustration that foreign bodies of moderate size may be tolerated even in the substance of the cornea.

Mr. O. B., æt. 21, of Saxton, N. Y., presented himself at my clinic in June, 1881, and stated that two years previously, while sharpening a millstone, a piece of the hammer flew off and hit the eye. A physician in Germany had tried to get it out, but broke off a piece and left the larger part in. It remained in its place, without changing its position or its appearance, only at times it became cloudy, but never caused pain. During the last three weeks, it seemed to approach the outer surface of the cornea, and then he had pain for the first time. When he presented himself to me, I found a dark, uneven, rough-edged foreign body in the substance of the cornea a little below the centre. Its blunt end was free and slightly raised over the level of the corneal epithelium; its sharper end and middle portion were wedged obliquely into the corneal tissue, the point apparently not far from Descemet's membrane. There was only a minimal layer of gray tissue around it, and some filaments stretched over a part of its free end. It was immovable, caused no pain, either spontaneously or during the movements of the eye and lids, or by pressure upon it. Sight was good, about $\frac{2}{3}$.

I thought that this foreign body of the cornea, although remarkably innocent, had better be out than in, and it was easy to win

the patient over to my opinion. I, therefore, thrust a narrow-bladed knife into the corneal substance, along the foreign body, and split the tissue toward the anterior edge of the splinter, close by, but not coming in contact with, the metal. The foreign body was then seized with a pair of anatomical forceps and easily extracted. It was a black piece of steel, with sharp, uneven edges, and measured 1 by 2 *mm*. No reaction followed the operation. The patient remained at the hospital one day.

EXTENSIVE RAVAGES FROM LUPUS, WITH SUBSEQUENT CICATRIZATION, LEAVING BUT ONE SMALL HOLE IN THE FACE WHICH REPRESENTS BOTH MOUTH AND NOSE, AND WITH COMPLETE CLOSURE OF THE ANTERIOR NASAL ORIFICES.

By JULIAN J. CHISOLM, OF BALTIMORE.

(*With wood-cut.*)

THE accompanying wood-cut, carefully prepared from a recently taken photograph, illustrates the extent to which the frightful ravages of lupus may go without destroying life. The eating away of the nasal cartilages, and even the extension of the ulceration to the cheek, is not a very uncommon occurrence in this form of rodent ulcer. The subsequent cicatrization may reduce the anterior nasal orifices to so small an opening, that a full-sized catheter can only be introduced. However small this opening may contract to, it is still most valuable for breathing purposes, and is especially of comfort during mastication. The following case, taken from the records of the Presbyterian Eye and Ear Charity Hospital, is the only one, in my experience, in which the nasal orifices were altogether obliterated, and in which the scarred condition of the entire face indicates that the ulcerated surfaces were not restricted to nose and cheeks, but were only limited by chin and forehead, and extended from ear to ear.

Her sufferings, while undergoing months of ulceration, and three years of an open ulcer before the healing process was completed, no one can calculate. Fortunately for her,

the last twenty-four years of comparative relief from suffering have somewhat effaced from memory her terrible experience. The wreck of a human face nevertheless remains, and a glance at it depicts, in a language vivid enough to frighten, the horrors through which she has passed. Would that a duplicate case of suffering can never be found! No appreciable cause for the inroads of this formidable disease could be discovered. There was no history of inherited syphilis made out, although such a cause may explain more readily the starting-point of the ulceration.

The following history is given by the patient herself:

Mrs. S., aged 51, a native of Maryland, and an inhabitant of the country, was a healthy girl till 15 years of age, when the disease which has produced such frightful disfigurement made its appearance, as a small ulcer in the roof of her mouth. It gave no special discomfort, and was not painful; but proved rebellious to treatment. At times it would nearly heal up; then again, without known cause, would extend its area. Finally it effected a perforation through the hard palate to the nasal cavity. With this perforation

the disease seemed to become quiescent, and for many years gave but little annoyance. In the meantime the girl developed to womanhood, and at the age of 21 was married. As time advanced she became the mother of eight healthy children.

Four years after marriage the edges of the opening in the roof of the mouth began to ulcerate, and steadily, although slowly, enlarged in all directions. By erosion the entire hard palate was destroyed, and with the disappearance of the roof of the mouth the nasal and buccal cavities became one common excavation. The ulcerative process could not have restricted itself to the palate process alone, as she has lost every tooth from both upper and lower jaw. Active medical treatment was instituted, and was changed from time to time when it proved ineffective: but all to no purpose.

The limits of the mucous membrane of the mouth and nose could not restrain the ulcerative process. From the anterior nasal orifices it crept out on the face, and for some months continued its ravages in spite of treatment, eating away the soft parts of the nose and spreading widely over the cheeks, until the whole face, from ear to ear and from forehead to chin, was one huge ulcer. Her appearance when the disease was at its height must have been fearful to behold, and her suffering intense. How far this destructive process would have extended was hard to foresee. Suddenly, after eight months of steady progress, and while she was still undergoing active internal medication, the disease was arrested. To the surprise of her physicians the ulcerative surfaces began to clear off and cicatrization commenced. The healing process continued without interruption for three long years, when the scarring finally became complete. She had then attained the age of 28. From that time the face has shown no disposition to renew the ulceration; and now, after 23 years, and at the age of 51, she still calls herself a healthy woman.

It was anxiety on account of her eyesight that induced her, at this late day, to leave her country home and seek medical advice in Baltimore.

Accustomed to see all kinds of facial deformities the appearance of this horrible face startled me, when for the first time she took off her veil and exposed it to view. It was a hideous mask, without expression; a blank face deprived of features and incapable of exhibiting any emotion whatever. From the forehead to the chin, or I may say even to the throat, and from ear to ear, there

was one extensive cicatrix of alternate ridges and polished surfaces, having in the centre a small round opening which the little finger could completely plug up. This orifice did the work of mouth and nose, and was the only facial inlet for food and air, so that while eating there could be no breathing. This opening could be puckered to closure by sphincter action. When the interior of the mouth was examined, all the palatine tissues were found absent, and nose with mouth formed one common cavity. There was not a tooth in either jaw. The alveolar processes had shrunk away in atrophy. There was no free movement to the jaws on account of the many cicatricial ridges over the cheeks and sides of the face, and possibly in the buccal cavity, into which the finger could not be sufficiently introduced for examination; yet to a certain extent she could gum her food. For 23 years she has nourished herself through this small facial aperture, even during the child-bearing period, and she is by no means an emaciated person. Her regular weight has been sustained at about 115 pounds. Even now, after so long an interval, the cicatricial skin is drawn tightly over her face, sharply outlining the contour of the shrunken lower jaw. There is no vestige of the anterior nasal orifices; a smooth cicatrix has completely stopped up the nasal outlet.

All the available skin left on the face, which the ulcerative process had not destroyed, had been required to aid in the completion of the cicatrization. On the right side the upper eyelid is effaced amidst frontal scars, and the lower lid is spread out over the cheek; the line representing its ciliary border, deprived of lashes, is midway between the eye and the mouth. From long exposure and having no protection, the right cornea has lost all transparency, and is covered with a much-thickened horny epithelium, through which the iris is not visible. From this eye the lachrymal tubes are all closed, and no trace of a secretion of tears exists. There is no cul-de-sac for either right eyelid, a continuous surface without a crease extending from forehead to cheek across the eye-surface of thickened cornea. Notwithstanding 23 years' exposure of this mucous membrane as cuticle, it is still smooth, polished, and soft, indicating both to the eye and to the touch a finer structure than the surrounding skin, so that with closed eyes the finger of the examiner could easily detect the cutaneous from the mucous surface.

On the left side, although the lower lid was absorbed in the

covering of the cheek, there is a thickened fold of skin at the outer and upper portion of the orbit, under which the left eyeball can be rolled for safety, and can be partially concealed. The upper two-thirds of this cornea have remained transparent, and give her the sight which she enjoys. There is no visible lachrymal secretion on this left side either, and the nasal duct is quite obliterated as far as any visible opening upon the lids is concerned, yet there must be some moisture about the eye to keep the cornea clear. It is the fear that this, her only useful eye, is in jeopardy, and that blindness is to be added to her other trials, that has brought her to the city for consultation.

Conservative surgery promises much for this face ; if not to remove deformities at least to increase her comforts and to protect her from threatened troubles. The oral orifice can easily be enlarged to facilitate the taking of food, and a nasal opening can be established through which she can carry on respiration while the mouth is closed for retaining food in the buccal cavity. There is also good ground for believing that the lids may be replaced in their normal relations to the eyeballs, and that the exposed surfaces, occasioned by this removal, can be covered by skin-grafting. These various operations would protect the eye, facilitate breathing, and also the taking of food. They have been explained to her, and she has them under advisement.

AN OBSCURE CASE IN NERVE PATHOLOGY ACCOMPANYING OPTIC NEURITIS.

BY JULIAN J. CHISOLM, M.D., OF BALTIMORE, MD.

I WOULD gladly know, from those more skilled in the pathology of the nervous system, the nature of a central lesion which gave, as its first appreciable symptom, in a previously healthy adult, pain in the movements of the left eyeball, with slight clouding of vision, and which progressed with such rapidity as to destroy sight in the eye within 24 hours. Then similar pains making their appearance in the right-eye movements, with subsequent blindness in it also. By the morning of the third day not even the appreciation of light was left to the patient, who, otherwise, felt perfectly well. Now commenced a new train of symptoms from the other extremity of the body, viz : interference with locomotion, with loss of sensation in the feet. A paraplegia developed, advancing steadily and rapidly up the spinal cord, affecting, progressively, feet, legs, thighs, pelvis, abdomen, and thorax. This destroyed life in 12 days from the commencement of the eye symptoms, the brain remaining clear to within a few hours of death. Loss of sight first, and afterward loss of power in the lower extremities. The following report of the case, recently under my care, supposed at first to be an eye disease only, will explain the symptoms as they occurred, *seriatim*, from the incipency to the fatal termination.

Mr. J., of North Carolina, aged 28, of fine physical development, consulted me for a very recent loss of sight. His previous history was that of good health, except chills, which he had had during the fall season. He lived on a farm which he cultivated,

while at the same time he attended to mercantile pursuits in a neighboring town. In getting up one morning he complained to his wife that the movements of the left eye caused pain, and upon going out upon his portico, after breakfast, to view his fields, he noticed that the vision in this eye was a little foggy. This did not, however, interfere with his attending to the farm duties. During the day the pain in the eye caused him much uneasiness, especially as he found that the sight was hourly becoming more dim, so that by night-time he was quite blind in the left eye. His eyes had never given him trouble before, and he had always considered his sight perfect. The following morning, after a restless, anxious night, he found that he could not perceive even light with his left eye, and that the right eye had also become painful in its movements, as had the left on the preceding day. Sight soon began to fail in this eye also, and by the morning of the third day he had lost sight altogether in both eyes. He determined to seek professional advice without loss of time, and, accompanied by a male relative, he left home for Baltimore, a distance of 300 miles by steamboat navigation, the only means of communication with his isolated home.

I saw him on the morning of the 4th day from the commencement of the attack. He had no appreciation of light in either eye, but had no special pain. The eyes were not injected. The pupils were large and brilliant, with the vacant stare so characteristic of nerve blindness. Ophthalmoscopic examination showed choked discs with very woolly outlines, but no other intra-ocular disturbance. He had no pains in the temple, nor headache, although the movement of the eyeballs still caused discomfort. In walking from his carriage into my office I noticed that his gait was not steady, and upon being questioned closely he admitted of some difficulty, which he had first observed on the steamboat, and which he had attributed to want of confidence in being led about in his blind condition. The choked discs, with clear media and normal tension, evidently referred to some postocular, probably intracranial trouble. I had him freely leeches, and ordered iod. pot., gr. x, with bichlor. hydrarg., $\frac{1}{16}$, every five hours. His bowels had been freely acted upon, on which account a purgative was not indicated. He had not passed his urine since early morning, and complained of a feeling of fulness, with an inability to relieve himself. The urine was drawn off by catheter.

When I visited him the next morning I found no improvement

in his symptoms. He complained of loss of feeling in his feet, with inability to move them. Tickling the soles of the feet caused no sensation, although the toes moved in response to the irritation. The bladder had been emptied at regular intervals by catheter.

On the morning of the 3d day of my treatment, the 7th of his disease, the loss of sensation in the lower extremities had extended to the hips. Titillation of the soles of the feet elicited no expression in reflex movements. The temperature as well as the color of the skin of the extremities was normal, showing no interference with the circulation. He was free of all pain. His mind was clear. He conversed freely about his case and dictated business letters. He had slept tolerably well. His pulse was 120. Respiration normal. Temperature 101° , being the same as on the day of his arrival in Baltimore. In his previous symptoms there was no change for the better. Sight still absent, and the same inability to empty his bladder. He had had no further action from his bowels, but as he had not taken much food and felt no abdominal discomfort, no purgative was given. The iod. pot. and mercury treatment was continued.

On the morning of the 4th day the anæsthesia had crept upward to a level with the umbilicus. As he expressed himself, he felt the dead feeling slowly encroaching upward, and wanted to know whether he should not look for a fatal result. When told that his chances for recovery were very slim, he telegraphed at once for his wife to come as speedily as possible to his bedside. He could not now feel the introduction of the catheter in emptying his bladder. The line between full sensation and the total loss of feeling on the abdominal surface was sharply defined on either side of the trunk, and was traced out with a nitrate of silver point. His pulse remained at 120. Respiration 25, and temperature 99° .

By the morning of the 5th day the anæsthetic line was on a level with the 6th rib. During the night his anal sphincter had given way, with involuntary discharges of a very offensive, watery nature. He sleeps most of the time, and yet when aroused his brain is so clear that in his waking moments he makes all business arrangements looking toward his death. He explains clearly his symptoms, finds that his breathing is becoming more shallow, but complains of no pain. During the night he has sweated much, and his skin is still quite moist.

On the morning of the 6th day the anæsthetic line had extended two inches higher upon his chest, otherwise no change from the day before. Bowels still continuing to discharge involuntarily an offensive fluid. His bladder is emptied by catheter every 5 hours, and nothing abnormal was found in the urine. There is no appearance of cerebral disturbance, although he sleeps most of the time. Skin still very moist.

On the morning of the 7th day the sensation was lost on a line two inches above the nipple, and equally on both sides of the trunk. The daily encroachment of the loss of sensation has been steady from the very beginning. Starting from the extremity of the spinal cord, its progress could be traced as each additional spinal nerve was invaded in the upward progress of the disease, until now the entire abdominal and thoracic walls are motionless and insensible. Respiration is labored and chiefly from the diaphragm. The temperature to-day is 98°. Pulse 120. Bowels still discharging offensive liquids. Urine clear, with no trace of albumen. It is drawn off every 5 hours as heretofore. Skin sweating. Answers questions rationally when roused, and gives instructions as to his business affairs during his waking moments.

At 4:30 A.M. on the morning of the 8th day since his arrival in Baltimore, and 12 days from the commencement of his first symptoms of painful movements of the left eyeball, he could not be roused. He remained in this comatose condition 3 hours, till 7 o'clock, A.M., when he died.

His wife arrived two hours after he ceased to breathe. She positively refused to permit an autopsy, and therefore the true cause of this singular fatal malady could not be determined. Were it not for the ophthalmic symptoms, as the initiatory movement of the fatal chain, it would seem as if a rapid spinal effusion, or a hemorrhage within the spinal sheath, had gradually filled up the serous cavities, and by pressure choked off all spinal nerve action, commencing from the most dependent part of the cord, and slowly advancing till it reached the nerve centre for all vital action. But how shall we explain the initiatory blindness, with absence of cerebral symptoms, preceding by three days the trouble in the lower extremities and bladder?

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1881.

By H. MAGNUS, Breslau ; C. HORSTMANN, Berlin ; AND
A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

E. NETTLESHIP, London ; C. E. FITZGERALD, Dublin ; E. MARCKWORT
and P. VON MITTELSTÄDT, Antwerp ; DANTONE, Rome ; VAN DER LAAN,
Lisbon ; HIRSCHMANN, Charkow ; S. M. BURNETT, Washington ; OLE
BULL and SCHIÖTZ, Christiania.

Translated by Dr. F. E. D'OENCH, New York.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE ;
GENERAL PATHOLOGY, DIAGNOSIS, AND THERA-
PEUTICS ; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL,
AND HISTORICAL SUBJECTS.

941. CARRERAS-ARAGÓ. Annual report of the ophthalmological literature of Spain, 1881, vol. i, *C. f. A.*, Nov. 1. Remarks on cauterizing with fire. 2. Amaurosis due to injuries in the peri-orbital region. 3. An interesting case of amaurosis due to hysteria. 4. Pilocarpine in diseases of the eye. 5. Treatment of conical transparent staphyloma of the cornea. 6. Corneal ulcer from infection. 7. Lesion of the cornea, with traumatic cataract and a fragment of gun-cap in the lens ; extraction of the foreign body and the lens ; recovery. 8. Monograph on diseases of the lachrymal apparatus.

942. DOBROWOLSKY. Ophthalmologisch-klinische Beobachtungen. *Wöchentl. klin. Zeitung*, 1881, Nos. 13 and 14. 1. Uræmic amaurosis in a girl of 10 years. 2. Sympathetic glaucoma. 3. Monolateral, inveterate, conver-

gent squint without amblyopia ex anopsia. 4. Neuro-retinitis due to pressure by a tumor of the lachrymal gland. 5. Diffuse retinitis in a case of a high degree of hypermetropia. 6. Injury of the conjunctiva by caustic potash; the totally opaque cornea cleared up again.

943. DONDERS, HESS, HOMER, ZEHENDER. Bericht über die dreizehnte Vers. d. ophth. Ges. zu Heidelberg, 1881; Rostock, 1881.

944. GALLERAUD. Des lésions traumatiques du globe de l'œil chez les travailleurs. *Thèse de Lyon*, 1881.

945. GAYET, HOCQUARD, et MASSON. Iconographie photographique appliquée à l'ophtalmologie. *Lyon Méd.*, 1881, Oct. 23.

946. JAVAL. Eclairage électrique au point de vue de l'hygiène de la vue. Soc. de Méd. Publ. de l'Hygiène Professionnelle. Séance du 26 Oct., 1881. *Progr. Méd.*, No. 51. Javal hopes that the use of the electric light may become universal. If the necessary precautions are observed, especially in the use of goggles, the eye is not endangered. In place of blue or gray goggles, Fieusal recommends yellow ones, as they absorb the violet rays more completely. Mesnil argues against the electric light.

947. GIRARD. Les petits photophobiques. *Rev. trim. d'Ophth. Prat.*, Oct., 1881.

948. LONGSPÉRIER. Un cachet d'oculiste. *Gaz. hebdomadaire*, 1881, Oct. 14.

949. MACÉ et NICATI. Recherches sur la comparaison photométrique des diverses parties d'un même spectre. *Annales de Chimie et de Physique*, 1881, vol. xxiv, 5th series.

950. MICHEL. Annual report on the progress of ophthalmology, founded by Dr. Nagel, vol. x. Report for the year 1879. Tübingen, 1881.

951. NARKIEWICZ-JODKO. Annual report of the ophthalmological literature of Poland for 1881. *C. f. A.*, Dec. 1. Przybylski. Observations on diphtheritic conjunctivitis and the connection of this disease with diphtheria and croup in general. 2. Machek. Retinitis pigmentosa. 3. Wicherkiewicz. Traumatic or syphilitic iridocyclitis. 4. Szokalski. The consequences of irritation of the optic nerve. 5. Rydel. Examination of the eye and its functions for the purpose of investigating its diseases. 6. Rymarkiewicz. Cases of vitia primæ conformationis oculi. 7. Kramsztyk. On neuroparalytic keratitis. 8. Jany. Cases of sarcoma of the choroid. 9. Gepner. Tenth annual report of the ophthalmological institute at Warsaw for 1880. 10. Kramsztyk. A foreign body in the orbit. 11. Talko. Injuries to the eye in recruits. 12. Mikucki. Eserine in keratitis. 13. Kramsztyk. The removal of metallic deposits from the cornea. 14. Kramsztyk. Pustular conjunctivitis. 15. Narkiewicz-Jodko. Cases of injury to the eye. 16. Talko. Ophthalmology at the third congress of the Polish physicians and naturalists at Cracow.

952. REICH. Israelites and military service. *Med. Zeitung*, No. 9. In 15 cases, all of them Israelites, a traumatic cataract had been intentionally produced, in order to escape military service. HIRSCHMANN.

953. SIMI. Associazione ottalmologica Italiana, iv. Riunione, Roma. *Boll. d'Ocul.*, vol. iv, No. 2, 1881, Oct.

954. SORMANNI. Cecità completa ad incompleta. *Geografia nosologica*

dell' Italia, Roma, 1801. The average of recruits blind on one or both eyes during the last 14 years was 7.5% ; Sicily furnished 9%. DANTONE.

955. TALKO. Injuries to the eye in recruits. *Gaz. lek.*, 1881, No. 7 ; Report in *C. f. A.*, 1881, p. 386. Among 235 simulants resp. persons suspected of self-injury, there were, in the year 1880, 16 with injuries of the eye produced intentionally. Injuries of the cornea are the most frequent—cauterization with powerful substances, or bites of leeches in the cornea. Injuries of the lens were also observed. See Reich, 952, this bibl.

956. TALKO. Ophthalmology at the third congress of Polish physicians and naturalists at Cracow. *Gaz. lek.*, 1881 ; Rep. in *C. f. A.*, p. 387. 1. The retinal changes visible with the ophthalmoscope in rabbits poisoned with bacillus anthracis. 2. Symptomatology and etiology of enophthalmia. 3. Case of anophthalmia.

957. WEBER. Examination of the eyes in the higher schools of Darmstadt. Appendix to the medical report of the grandducal ministerial department for the years 1877–80. Darmstadt, 1881. The author treats the subject very thoroughly, and comes to the following conclusions: 1. In view of the injurious results of poor illumination, the windows, where skylights cannot be introduced, should not extend lower down than the height of the scholars when standing upright ; where there are windows already, they should be provided with ground glass up to this height, on the south and west sides in their entire extent ; rooms for drawing and female handiwork should be lighted from above. In view of other demands connected with the question of illumination, a revision of the laws governing the building of schools, based on the principles of hygiene now established, is urgently advised. 2. In view of the attributes of a good school-bench set forth, the introduction of Lickroth's school-bench, with a top 50 *cm.* broad, is to be ordered ; for drawing and female handiwork they should be replaced by other apparatus. 3. In view of the different size of the scholars of the same class, they should receive seats corresponding to their height, as determined at the beginning of each term. 4. In view of the necessity of sufficient ventilation, and the injurious influence of long-continued sitting, and its insufficient neutralization by play, as proved by statistics, instruction should be limited to three quarters of an hour at a time, and the remaining fifteen minutes be devoted to gymnastic exercises, drilling, etc. 5. In view of the injurious influence of poor carriage of the body, the teachers are instructed to see that the distance between eye and work is at least 35 *cm.*, and that there is always the necessary amount of light, to be determined by appropriate trial-plates. 6. In view of the injurious influence of poor material, all printed matter not in accordance with the principles established in respect to it should be discarded, also checkered blank-books, plates, models for drawing, printed charts, and too fine needlework. 7. In view of the injurious influence of sewing of all kinds on children not at least ten years old, and in view of the necessity of stricter mental occupation at this age, a complete reform of this instruction is demanded. 8. In view of its mentally as well as physically injurious influence, the present system of penmanship should be replaced by a round-hand form. 9. In view of the unprofitableness of dictation, it should be forbidden from principle, and only allowed for the shortest notes. 10. In view of the necessity of constant medical control over the hygienic postulates of the school,

a member of the supreme medical board is to be provided with sufficient administrative and executive authority, or a special physician to be commissioned for that purpose.

958. WOLFE. On diseases and injuries of the eye. A course of systematic and clinical lectures to students and medical practitioners. With ten colored plates and 157 wood engravings. London, 1882, Churchill. The ophthalmoscopic part by Magnus.

b.—STATISTICAL PAPERS.

959. Aerztlicher Bericht des K. K. allg. Krankenhauses zu Wien vom Jahre 1880. Diseases of the eye, p. 66-76.

960. Bericht der K. K. Krankenanstalt Rudolph-Stiftung in Wien vom Jahre 1880. Diseases of the eye. p. 163-176. 5 cases of glaucoma treated by iridectomy; 13 cases of senile cataract operated by linear extraction: 11 successful, 2 failures.

961. DESPAGNET. Clinique ophthalmologique du Dr. Galezowski, Relevé statistique des maladies soignées et des opérations pratiquées du 1. Juillet, 1880, au 1. Juillet, 1881. *Rec. d' Ophth.*, Oct., Nov., Déc., continued. Vide No. 458 this bibl. Carbolic-acid spray 1% is highly recommended for blennorrhoeic conjunctivitis.

962. GEPNER. Tenth annual report of the ophthalmic institute of Warsaw for the year 1880. *Gaz. lek.*, 1881. Report in *C. f. A.*, p. 385. 4,292 patients were treated and 322 operations performed. Peripheric linear extractions were performed in 86 cases of senile cataract: in 78 cases $V > \frac{1}{10}$, in 3 less or equal to $\frac{1}{10}$, 2 were failures; 66 iridectomies, 19 of them for glaucoma.

963. HERZENSTEIN. Examination of the scholars of the military school at Orel. *Wojinno-sanitar*, Dec., 1881, No. 11. 443 scholars were examined; 39.3% had myopia. In the lowest class the percentage of myopia was 16.3, in the highest 51.2. $V=1$ in 46.7%; $V > 1$ in 24.8%; $V < 1$ in 28.5% (without correcting-glasses). HIRSCHMANN.

964. Manhattan Eye and Ear Hospital. Twelfth annual report, New York, 1881. From Oct. 15, 1880, to Oct. 15, 1881, 2,819 patients were treated: 15 extractions; 40 tenotomies; 18 iridectomies.

965. REICH. The visual power of Russian scholars. An oculistic study. *Wratschebnija Wetomosti*, No. 44 and reprint. Reich compiles the result gained from 8,500 cases, boys and girls, examined by himself and others. In all the schools often $V > 1$ and even greater than $1\frac{1}{2}$, the number varying between 15% and 64%. In the schools of Tiflis, examined by Reich himself, 33% had V equal to or greater than $1\frac{1}{2}$. The average power of vision in the schools he estimates at $1\frac{1}{2}$. In the higher classes the proportion is less favorable, and the number of scholars with $V > 1$ is less. In two schools of Tiflis, for instance, the percentage falls from 31% to 15%, and from 41% to 10%. In schools for girls this difference is smaller. $V < 1$ was more frequent among girls than boys. In the lowest classes the percentage was 13-15 for the boys and 17-18 for the girls. In the higher classes $V < 1$ in at least 20%. HIRSCHMANN.

966. ROSMINI. Rendiconto clinico dell' istituto oftalmico di Milano per il quinquennio 1874-1878. *Gaz. Med. Ital. Lombardia*, No. 48 and 49, Dec., 1881. Continued. Vide No. 30, this bibl.

967. STEFFAN. Nineteenth annual report of the ophthalmic institute of Dr. Steffan at Francfort o. M. Francfort, 1881. 4,953 patients were treated during the year. 21 senile cataracts were operated upon by peripheric extraction with a flat flap-section, all of them successfully; 13 iridectomies; 19 operations on the muscles.

968. STOER. Comprehensive report of eye patients treated in the year 1880. Ratisbon, 1881. 1,239 patients; 12 extractions; 30 iridectomies; 4 squint operations.

c.—OPHTHALMOLOGICAL JOURNALS.

German Journals.

969. *v. Graefe's Archiv für Ophthalmologie*, Berlin, 1881, Bd. xxvii, 3.
1. Kuhnt. Colored induction of light. 2. Fuchs. An entoptic phenomenon observed in certain movements of the eyes. 3. v. Hippel. Monolateral color-blindness. 4. Königstein. Notes on histology: *a.* the nerves of the sclera; *b.* on the pupillary membrane. 5. Fuchs. The opacity of the cornea in glaucoma. 6. Hänsell. Preliminary communication of experiments in vaccinating syphilis upon the iris and cornea of the rabbit. 7. Mandelstamm. A case of sarcomatous ectropium, with some notes upon trachoma. 8. Rieger and v. Forster. The eye and spinal cord. 9. Osterwald. A new case of leucæmia with bilateral exophthalmus, due to tumors of the orbit. 10. Vossius. The growth and physiological regeneration of the epithelium of the cornea. 11. Baumgarten. Reply to Mr. J. Michel.

970. *Archiv für Augenheilkunde*. Herausg. von Knapp u. Schweigger. Bd. xi, 1. Issued Oct. 30, 1881. 1. Pflüger. Further observations on color-blind persons. 2. Wieth. A case of congenital deformity of the optic disc. 3. Adamück. Some observations on tumors of the eye. 4. Bettman. Examination of the eyes in two fatal cases of anæmia. 5. Knapp. Report of a seventh hundred of cataract-extractions. 6. Browning. A binocular ophthalmotrope. 7. Knapp. Report on the ophthalmological section of the London International Medical Congress, Aug. 3-9, 1881. 8. Knapp. Report on the ophthalmological congress held at Heidelberg, Sept. 14 and 15, 1881. 9. Kaiser. The association of words with colors. 10. Magnus, Horstmann, Nieden. Systematic report on the progress of ophthalmology during the months of July, August, and September, 1881.

971. *Klinische Monatsblätter für Augenheilkunde*. Zehender, Bd. xix, Oct.
1. Landesberg. On optico-ciliary neurotomy. 2. Schiess-Gemuseus. Traumatic myopia, gradual spontaneous recovery. 3. Schiess-Gemuseus. Long-continued formation of vesicles on the cornea after inflammation of the other eye. 4. v. Forster. On albinism. 5. Bibliography.—*November*. 1. Schweigger. The use of strychnine, and remarks on visual troubles due to hysteria. 2. Vossius. The treatment of diphtheritic conjunctivitis. 3. Skrebitzky. Case of anophthalmus with congenital cysts in the lower lids. 4. Bibliography.—*December*. 1. Emmert. The relative size of after-images, with remarks by

Zehender appended. 2. Schaefer. A case of congenital monolateral zonular cataract. 3. Schiess-Gemuseus. Two cases of extraction of foreign bodies with the electro-magnet. 4. Bibliography.

972. *Centralblatt für praktische Augenheilkunde*, Hirschberg, October. 1. Horstmann. Recurrent iritis. 2. Reports of societies, Internat. Med. Congr. Abstract of the communications to be made in section ix: Ophthalmology. 3. Bibliography.—November. 1. Schubert. Cases of retinitis syphilitica. 2. Purtscher. A case of erythroptosis after traumatic cataract. 3. Schenkl. Congenital defective development of the levator palp. sup., rect. ext., rect. int., rect. sup., and obl. inferior in both eyes. 4. Alexander. Extraction of a piece of iron from the vitreous body by the electro-magnet. 5. Carreras-Aragó. Annual report of the ophthalmological literature of Spain, 1881. Vol. i. 6. Reports of societies. Intern. Med. Congr. Abstract of ophthalmology (continued). 7. Bibliography.—December. 1. Hosch. Primary sarcoma of the iris. 2. Hosch. A case of gumma of the ciliary body. 3. Kolbe. The most practical methods for examining the color-sense of large numbers of people. 4. Cohn. New methods for testing the color-perception by pseudo-isochromatic plates. 5. Narkiewicz-Jodko. The ophthalmological literature of Poland for 1881. 6. Society reports. Intern. Med. Congr. Abstract of ophthalmology (continued). 7. Bibliography.

French Journals.

973. *Revue clinique d'oculistique du Sud-Ouest*. Armaignac. Sichel. Meyer. No. 13. October, 1881. 1. Armaignac. Considérations sur l'étiologie et la thérapeutique des affections des voies lacrymales (suite). 2. Armaignac. Cécité temporaire presque complète survenue subitement chez un jeune homme à la suite d'un travail intellectuel exagéré. Guérison complète. 3. Armaignac. Kyste séreux de l'angle externe de l'œil gauche. Exstirpation. Guérison. 4. Poncet. Congrès international de Londres, août, 1881; section d'ophtalmologie (fin).—No. 14. November, 1881. 1. Armaignac. Considérations sur l'étiologie et la thérapeutique des affections des voies lacrymales (suite). 2. Armaignac. Des applications de la greffe dermique à la blepharoplastie: épithéliome de l'angle interne de l'œil. Ablation. Greffe dermique. Guérison. 3. Meyer. Ectropion cicatriciel. Greffe hétéroplastique. Guérison. 4. Caudron. Observations recueillies. 5. Berger. Ectropion considérable de la paupière inférieure. Greffe par transplantation d'un lambeau taillé dans la peau du dos combinée avec la blepharoplastie.—No. 15. December, 1881. 1. Armaignac. Considérations sur l'étiologie et la thérapeutique des affections des voies lacrymales (fin). 2. Secondi. Quatre cas de guérison radicale et persistante de décollement de la rétine par le traitement chirurgical.

974. *Archives d'Ophthalmologie*. Panas. Landolt. Poncet. No. 6. September, October, 1881. 1. Hocquard. Plaques épithéliales de la cornée. 2. Damalix. Du traitement des affections chroniques de la cornée par le massage de l'œil. 3. Delapersonne. Du chancre palpebral. 4. Macé et Nicati. Contribution à l'étude du champ visuel des couleurs. 5. Poncet. Congrès international de Londres. 6. Thomas. Revue bibliographique.

975. *Recueil d'Ophthalmologie*. Galezowsky. Cuignet. No. 10. October, 1881. 1. Despagnet. Clinique ophthalm. du Dr. Galezowski. Relevé sta-

tistique des maladies soignées et des opérations pratiquées du 1. Juillet, 1880, au 1. Juillet, 1881 (suite). 2. Cuignet. De la conjonctivite chronique simple (fin). 3. Than. Clinique ophthalmologique du Dr. Dehenne. 4. Hirschberg. Embolie puerpérale. 5. Galezowski. Congrès médicale de Londres. 6. Parent. Bibliographie.—No. 11. *November*, 1881. 1. Despagne. Clinique ophthalm. du Dr. Galezowski. Relevé statistique des maladies soignées et des opérations pratiquées du 1. Juillet, 1880 au 1. Juillet, 1881 (suite). 2. Knies. Ophthalmie sympathique. 3. Dufour. De l'action de l'iridectomie dans l'hydrophthalmie. 4. Rodet. La Cécité en Espagne. 5. Galezowski. Congrès de Londres. 6. Boggs. Bibliographie étrangère. 7. Chevallier. Bibliographie française.

976. *Annales d'Oculistique*. Warlomont. *September-October*, 1881. 1. Donders. Sur les systèmes chromatiques. 2. Van Duyse. Le colobome de l'œil et le kyste sereux congénital de l'orbite. 3. Gayet. Hocquard. Masson. Iconographie photographique appliquée à l'ophthalmologie.—*November-December*, 1881. 1. Donders. Sur les systèmes chromatiques. 2. Parinaud. Des troubles visuels qui diminuent l'aptitude à reconnaître les signaux colorés. Exposé d'un nouveau mode d'examen. 3. Loiseau. Répertoire bibliographique.

English Journals.

977. *The Ophthalmic Review*, a monthly record of ophthalmic science. Grossman. Smith. *November*, 1881. 1. Hutchinson. On retinitis pigmentosa and heredity. 2. Ophthalmological Society of Great Britain, Oct. 13. 3. Jackson. Apparent movements of objects during involuntary movements of the eyes. 4. Adams. Uniocular diplopia. 5. Ord. Uniocular diplopia. 6. Adams. Suppurative ophthalmitis. 7. Brailey. Tubercular disease of the iris. 8. Walter Edmunds. Perineuritis optica. 9. Sympson. Tubercle of cerebellum, with double optic neuritis.—*December*, 1881. 1. Critchett. Practical remarks on cataract. 2. Hutchinson. On retinitis pigmentosa and heredity. 3. Priestley Smith. Retinitis-pigmentosa connected with a history of maternal shock.

Spanish Journals.

978. *La crónica oftalmológica*. Del Toro. *October*. Del Toro. Intoxicacion par la pilocarpina.—*November-December*. Lopez Ocaña. El parasitismo en oftalmologia.

979. *Revista especial de oftalmología, sífilografía, dermatología, y afecciones urinarias*. Rodriguez Viforcós. *October*. Perez Cabelleros. La oftalmometrologia, sus procedimientos y aplicaciones.

In the last numbers of the year there are no original ophthalmological papers.

980. *Revista de ciencias médicas*. Carreras-Aragó. *October*. 1. Carreras-Aragó. El Daltonismo y los alteraciones visuales en los empleados de los ferrocarriles. Continued from No. 6 u. 7. 2. Lopez-Ocaña. Un tercer caso de pseudo-hemorragia in ocular.—*November*. 1. Montardit. Jeringa para inyecciones en las vias lagrimales. 2. Carreras-Aragó. El Daltonismo y las alteraciones visuales en los marinos de guerra y mercantes.

981. *Anales de la Sociedad Española de Hidrologia Médica*. Madrid. *November*, 1881. Garcia Lopez. Paralisis general con ceguera completa, curada con las aguas minerales de Ledesma.

982. *Boletín de medicina naval.* November, 1881. Ruiz Sanroman. Estudios sobre el Daltonismo aplicado a la navegacion.

983. *La clinica.* November, 1881. Montero. Caso notable de glaucoma agudo.

984. *Revista de medicina y cirurgica prácticas.* November, 1881. Arman-gué. Opacidad de la córnea curada con un colirio de amoniaco liquido.

985. *Los avisos.* November, 1881. Gastaldo. Blefaritis ciliar, Blefaro-adenitis, su filosofia y su tratamiento.

986. *El siglo Médico.* October, 1881. Osio. Congresso médico internacional de Londres. Oftalmologia.

Italian Journals.

987. *Bolletino d'Oculistica.* Anno iv. No. 2. Simi. Associazione ottalmologica italiana. iv. Riunione; Roma.—November, 1881, No. 3. 1. Secondi. Lettera casi di guarigione permanente del distacco retinico. 2. Simi. Glaucoma.—December, 1881. Letter of Dr. Maréchal to Simi, in regard to an apparatus for determining color-perception.

The *Annali d'Ottalmologia*, Fasc. 6, did not appear during the last quarter of the year 1881.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

988. ALEXANDER. Extraction of a chip of iron from the vitreous with the electro-magnet. *C. f. A.*, Nov. Good result. The position of the piece of iron in the eye could not be determined by means of a magnetic needle as described by Pooley.

989. BADAL. L' élongation des nerfs et ses applications au traitement des nevralgies du trijumeau. *Gaz. hebd. des. Sc. Méd. de Bordeaux*, Dec., 1881.

990. BAJARDI. Dell' adenite scrofulosa in rapporte con alcune affezioni oculari. *Gaz. degli Ospitali*, vol. ii, No. 20, Oct., 1881. Report of three cases.

991. BECKER. The development of sympathetic ophthalmia. Sixth meeting of the neurologists and alienists of Southwestern Germany, at Baden-Baden, May 21 and 22, 1881. *Archiv für Psychiatrie*, Bd. xii, 1, p. 250. The transfer probably takes place through the nerve-centres of the blood-vessels from one uvea to the other.

992. BERLIN. The analogy between so-called commotio retinæ and concussion of the brain. *The same journal*, p. 253.

993. BRAILEY. On the pathology of sympathetic ophthalmitis. *Trans. of the Intern. Med. Congr.* London, viii.

994. CHODIN. Course of operations on the eye. With 85 illustrations in the text and 4 plates. St. Petersburg, 1881. Complete text-book of operative ophthalmology, based upon the latest results and investigations.

995. DELSOL. De la cautérisation ignée dans quelques affections de la cor-née. *Thèse de Paris*, 1881.

996. DEL TORO. Remarks on cauterizing with fire. Report in *C. f. A.*, p. 339. It is called for in scrofulous pustules and in acute and chronic ulcers of the cornea ; also in lachrymal fistulas.

997. DUFOUR. Transplantation des muqueuses sur l'œil. *Transac. of the Intern. Med. Congr.*, London, viii. *Rev. Méd. de la Suisse Rom.*, 1881, No. 10, Oct. 15. The human conjunctiva may be replaced by that of the rabbit, also by other mucous membranes. There must be no bleeding of the spot upon which the mucous membrane is transplanted. Great care must be taken in applying the sutures; it is best to insert them into the patch before transplanting it. Dufour did not observe any shrinkage of the transplanted piece of mucous membrane. It is not advisable to use salicylic acid during or after the operation.

998. FÖRSTER. Some improvements in the operation for senile cataract. *Schlesische Gesellsch. f. vaterländische Cultur*, Oct. 18, 1881. *Breslauer ärztl. Zeitschr.*, 1881, No. 24, and Rep. of the 13th meeting of the Ophth. Soc. at Heidelberg. When the cataract ripens slowly, a squint-hook, after previously making an iridectomy, should be passed over the cornea several times, pressing and rubbing upon it; the corticalis, being not yet entirely opaque, is thus broken up within the capsule. The capsule should not be opened with the cystotome, but with a fine forceps, as in this way the greater part of the anterior half of the capsule may be removed from the eye, thus diminishing the danger of subacute iritis or iridocyclitis. Carbolic acid for disinfecting the eye or the instruments should be discarded. The instruments, however, should be disinfected in absolute alcohol before the operation. Not much weight is attached to disinfecting bandages.

999. VON FORSTER. On albinism. *Klin. Monatsbl. f. Augenh.*, Oct. Good color-perception; disc gray.

1000. FÜRSTNER. Further communication on unilateral destruction of the globe. vi. meeting of the neurologists and alienists of Southwestern Germany, at Baden Baden, May 21 and 22, 1881. *Arch. f. Psychiatrie*, Bd. xii, 1, p. 244.

1001. GALEZOWSKI. Des thromboses vasculaires amenant des neuritis ou des signes d'embolie. *Transact. of the Intern. Med. Congr.*, London, viii.

1002. GRADMIGO. Dell'ascoltazione degli occhi. Comunicazione al Congresso degli oculisti in Roma, *Gaz. Med. Ital. Prov.-Venete*, 1881, Oct.

1003. HAENSELL. Preliminary communication of experiments in inoculating syphilis in the iris and cornea of the rabbit. *Graefe's Archiv*, Bd. xxvii, 3. Iritis and little nodules developed upon the iris which very much resembled the syphilitic affections of the human eye.

1004. HOCK. Some practical hints in ophthalmic surgery. *Wiener Klinik*, Bd. vii, 11.

1005. HOWE. On a method of opening closed pupil after operation for cataract. *Transactions of the Internat. Med. Congr.*, London, viii.

1006. KRAMSZTYCK. On the removal of metallic deposits from the cornea. *Gaz. lek.*, 1881, C. f. A. p. 386.

1007. MARTIN. Nouvelles applications du fer rouge en chirurgie oculaire et de quelques modifications apportées aux galvanocautères. *Transact. of the Intern. Med. Congr.*, London, viii.

1008. OWEN. Removal of a fragment of iron from the vitreous body by means of the electro-magnet. *Brit. Med. Journ.*, 1881.

1009. PONCET. Comment l'ophthalmie sympathique peut-elle se produire après l'énervation? *Transact. of the Intern. Med. Congr.*, London, viii.

1010. SCHIESS-GEMUSEUS. Two cases of extraction of foreign bodies by means of the electro-magnet. *Klin. Monatsbl. f. Augenheilk.*, Dec., 1881.

1011. SCHÖLER. On sclerotomy; a contribution refuting the permeability of scleral scars. *Transact. of the Intern. Med. Congr.*, London, viii.

1012. SCHULTZ. Experiments on degeneration and regeneration of the nerves of the cornea. *Inaug. Dissert.* Dorpat, 1881. Following are the results obtained: 1. The degeneration of human nerve-fibres is due to an inflammatory irritation, and consists in a granular, more rarely a fatty disintegration of the axis-cylinder, and of the nuclei of the sheath. 2. The degeneration always stops at a nodal point, generally at one nearest the point of irritation on the cranial side; it always progresses in a longitudinal, never in a transverse direction. 3. Degeneration and regeneration cannot be separated in point of time; they are co-existent, *i. e.*, regeneration begins before the products of degeneration have disappeared (by solution, absorption, etc.). 4. The proliferation of the nuclei is the result of the inflammatory irritation; it begins at the nuclei of the sheaths lying within the nodal points which had remained intact. 5. The nuclei probably increase by division. 6. The newly formed nuclei form an (endothelial) coat of the old sheaths, give rise to the formation of new sheaths, and finally become normal nuclei of the latter. The excess of new nuclei disappears; how, is not shown. 7. The proliferation of the nuclei and the regeneration of the axis-cylinders are in no connection; the two processes are entirely independent of each other.

1013. ULLMANN. Contribution à l'étude sur l'étiologie de la cataracte. *Thèse de Paris*, 1881.

III—INSTRUMENTS AND REMEDIES.

1014. ANDREW. Use of eserine in sympathetic irritation of the eyes. *Lancet*, No. 25.

1015. AUBRY. Ophthalmostato. *Dict. encycl.*, vol. xvi.

1016. BAUDRY. Simple note sur l'emploi du prisme pour provoquer la diplopie monoculaire. Application à la recherche de la simulation. Lille, 1881.

1017. BÉNAKY. Du keratocone et de sa correction par les verres coniques. Paris, 1881, Bailliére. 100 pages.

1018. BERTHOLD. Boracic acid in diseases of the eye and ear. Verein f. Wissensch. Heilkunde in Königsberg, 10, Mai, 1880. *Berl. klin. Wochenschr.*, 1881, No. 43.

1019. BRENAC. Recherches comparatives sur le Jaborandi, la Pilocarpine, et la Jaborine. *Thèse de Lyon*, 1881.

1020. BRETTEAUER. The local application of iodoform. Report of the thirteenth meeting of the ophth. soc. at Heidelberg, 1881. Iodoform not only seems to cause no irritation in diseases of the conjunctiva and cornea, but also seems to diminish the secretion of the conjunctiva, to bring about retrogressive changes in granulations, and to act very beneficially in sclerosing keratitis. It is used in form of a powder, or as a salve in equal parts with vaseline.

1021. CARRERAS-ARAGÓ. Pilocarpine in diseases of the eye. *Revista de cienc. med.*, de Barcelona. Report in *C. f. A.*, p. 341. Its use is indicated in all affections in which an energetic contraction of the pupil is desired; for instance, in corneal ulcers threatening incarceration of the iris. Success slight in detachment of the retina.

1022. CHATZKELEWITSCH. The pharmacological and therapeutical importance of pilocarpine in general, and particularly in ophthalmology. *Inaug. Dissert.*, St. Petersburg, 1881.

1023. COURSSERANT. Note sur un ophthalmoscope à deux observateurs. *Rev. d' Ocul., du Sud-Ouest*, No. 15.

1024. DIANOUX. Du traitement du décollement de la rétine par les injections sous-cutanées de nitrate de Pilocarpine. *Arch. d' Opth.*, No. 1.

1025. JOSSE. Du traitement du décollement rétinien par le nitrate de Pilocarpine. Paris, 1881, Doin. 60 pages. Out of sixteen cases, fifteen were successfully treated by subcutaneous injections of pilocarpine. Compare the less favorable results obtained by Carreras-Aragó precisely in regard to this point; No. 1021 this bibl.

1026. KAUDERS. Pilocarpine as an antidote of atropine. *Wiener med. Wochenschr.*, 1881, No. 45. Pilocarpine is a speedily-acting and sure antidote of atropine.

1027. KLEIN. The use of yellow ointment in diseases of the eye. *Wiener med. Presse*, No. 43. In all forms of keratitis, either with or without atropine.

1028. KRÖMER. On the use of antiseptic solutions of atropine and eserine. *Correspondenzblatt f. schweizer Aerzte*, 1881, No. 19. Boiling the solutions and adding boracic acid 4:100 and carbolic acid 1:1000 keeps them clear and free from the development of bacteria.

1029. LEONARDI CATTOLICA. Chloride of zinc in a solution of 1-3 % in all diseases of the conjunctiva. *Boll. d' Ocul.*, vol. iv, 4, Dec., 1881.

1030. MARÉCHAL. Un appareil pour l'appréciation de l'acuité chromatique dans un examen sommaire du personnel de la marine et des chemins de fer. *Transact. of the Intern. Med. Congr.*, London, viii; and a letter on this subject in *Boll. d' Ocul.*, Dec., 1881.

1031. SCHÖLER. Refraction-ophthalmoscope. *Verhandl. der physiol. Gesellsch. zu Berlin*, 1881, No. 4 and 5. For the determination of all forms of ametropia, including astigmatism. With an illustration.

1032. SCHWEIGER. The use of strychnine, and remarks upon visual disturbances due to hysteria. *Clin. Monatsbl. f. Augenheilk.*, Nov.

1033. SZIKLAI. Pilocarpinism. *Wiener med. Wochenschr.*, No. 35. Case of poisoning by pilocarpine.

1034. SZPILMAN and LUCHSINGER. Atropine and unstriped muscular fibres. *Arch. f. d. ges. Phys.*, Bd. xxvi.

1035. THAN. Clinique ophthalmologique du Dr. Dehenne. Note sur l'emploi thérapeutique de l'Eserine. *Rec. d' Opth.*, Oct. In abscesses of the cornea, in purulent ulcerations, and serpent ulcers. MARCKWORT.

1036. UHTHOFF. Remarks on determining the field of vision. *Klin. Monatsbl. f. Augenheilk.*, Oct. Combination of Förster's and Scherk's perimeters.

1037. VERON. Considérations sur le traitement de l' amblyopie par la strychnine. *Thèse de Paris*, 1881.

IV.—ANATOMY.

1038. CIACCIO. Sopra il distribuimento e la terminazione delle fibre nervee della cornea, e sopra l' interna costruttura del loro cilindro dell' asse, nuove investigazioni microscopiche. Bologna, 1881.

1039. DENISSENKO. On the external granular layer of the retina of the eel and on oedema of the cornea in morbus Brightii. Report of the thirteenth meeting of the Ophth. Soc., Heidelberg, 1881.

1040. DUWEZ. Nerf optique ; anatomie et pathologie. *Dict. encycl.*, vol. xvi.

1041. GIONAVARD. Caso di anoftalmia doppia congenita. Mancanza dei nervi ottici. Atrofia dei lobi occipitali. *Riv. sperim. di frenatria e di medicina leg.*, vol. iv, 3. Complete absence of the globe, ciliary ganglion, optic nerve, and chiasm ; fatty degeneration of the muscles on both sides.

1042. KÖNIGSTEIN. Notes on histology. *Graefe's Arch.*, Bd. xxvii, 3. 1. The nerves of the sclera. The human sclera has nerves of its own ending within it. 2. The pupillary membrane. It consists of 4-5 larger blood-vessels, forming arches ; numerous small blood-vessels, coming from the iris and communicating with each other, empty into these arches ; the centre of the pupillary membrane is always free from blood-vessels. The blood-vessels of the pupillary membrane do not come from the circulus iridis minor, but in conjunction with the blood-vessels of the ciliary muscle and ciliary processes form the ciliary blood-vessels. The retrogressive change begins toward the end of the 7th or beginning of the 8th month.

1043. KUHNT. Some senile changes in the human eye. Report of the 13th meeting of the Ophth. Soc., Heidelberg, 1881. The senile changes in the periphery of the retina lead to atrophy of the nervous elements ; besides ordinary atrophy an amalgamation of the two granular layers takes place and the rods and cones disappear. A high degree of hypertrophy of the connective tissue develops. There is also cystoid degeneration. The ciliary body shows : 1, thickening and vascularization of the reticulate substance ; 2, the formation of excrescences projecting into the vitreous body ; 3, a development of cysts. Atrophy of the choroid is a senile change almost constantly observed, and may be considered as the primary change, which in turn gives rise to those in the retina.

1044. KUHNT. On the physiological excavation of the optic nerve. The same rep. Kuhnt denies Mauthner's assertion that the excavation visible with the ophthalmoscope is entirely or partly filled with diaphanous nerve fibres ; the excavation really exists.

1045. KUHNT. On the structure of the human fovea centralis. The same rep. There is no thinning of the inner layers of the retina at the bottom of the fovea centralis ; they disappear entirely with the exception of the musivic layer. Only the cones, the outer granular layer, and the outer fibrous layers remain, the limitans interna joins them almost immediately.

1046. RYMARKIENVICZ. Cases of vitia primæ conformationis oculi. *Medycyna*, 1881. *C. f. A.*, p. 384. Case of congenital cataract ; two cases of persistent hyaloid artery ; case of two pupils in the same eye.

1047. SCHENKL. Congenital imperfect development of the levator palp. sup., rect. ext., rect. int., rect. sup., and obl. inf. of both eyes. *C. f. A.*, Nov.

1048. SKREBITZKY. Case of anophthalmus with congenital cysts in the lower lids. *Klin. Monstabl. f. Augenh.*, Nov.

1049. STILLING. The chiasm and optic tract. *Arch. f. Psychiatrie*, Bd. xii, 1, p. 246. The uncrossed fibres are the most numerous in the chiasm, then those of the two commissures, while the crossed fibres are the fewest in number. The latter lie within the uncrossed fibres like in a groove. The anterior commissure is also found in animals, very distinctly in the dog. It occupies mainly the upper surface of the chiasm, the posterior commissure the lower. The posterior commissure may be traced to the corpus geniculatum laterale, mediale, the corpora quadrigemina, and the radix descendens, to which crossed and uncrossed fibres also go, so that anatomically and physiologically considered, it certainly belongs to the optic tract. Stilling could not trace it as far as the tectum opticum. The radix descendens divides into two branches: the larger one passes under the corpus geniculatum mediale into the lemniscus and can be traced into the olive; the smaller one ends in the pons Varolii. Within the optic nerve the fibres are not arranged as generally represented; those of the commissures, both the crossed and uncrossed, lying closely together.

1050. VIRCHOW. The blood-vessels of the choroid of the rabbit. *Transact. of the Phys.-Med. Soc.*, Würzburg, new series, vol. xvi, and reprint. Würzburg, Stahel. The rabbit has two ophthalmic arteries: the smaller internal ophth. artery comes from the internal carotid; the larger external ophth. artery comes from the internal maxillary artery. There are also two arteries in the choroid (posterior ciliary arteries), a temporal and a nasal one, each supplying one half of the uvea; both come from the external ophthalmic artery, though the nasal branch is also connected with the internal ophthalmic artery. The short posterior ciliary arteries are branches of these two arteries. The veins collect near the ciliary margin of the choroid. There are 4 vorticose veins; the veins in the choroid form a peculiar network, which must be divided into a ciliary and a proximal zone.

1051. VOSSIUS. The growth and physiological regeneration of the epithelium of the cornea. *Graefe's Arch.*, Bd. xxvii, 3. The epithelium of the cornea is reproduced by the basal cells, the cells subdividing after preceding karyokinesis.

1052. WOLFF. The nerves of the cornea. *Arch. f. micros. Anatomie*, Bd. iii, 1881, Dec. In the cornea the axis-cylinder is enveloped by the medullary substance and the sheath of Schwann. Most of the corneal nerves form a network; some terminate in fine points in the epithelium or corneal substance without any thickening. No connection between the nerves and corneal corpuscles or epithelial cells could be demonstrated.

V.—PHYSIOLOGY.

a.—GENERAL PHYSIOLOGY: OPTICS, CORNEA, IRIS, REFRACTIVE MEDIA.

1053. CAHN. The physiological and pathological chemistry of the eye. *Zeitschr. f. phys. Chemie.*, Bd. v, p. 214. The reaction of fresh retinae is generally alkaline; on the external surface sometimes acid. The retina of the

ox contained : water, 86.52 ; albuminous substances, 6.77 ; substances resembling albumen, 1.59 ; alcohol extract, 0.25 ; aqueous extract, 0.42 ; cholesterine, 0.77 ; fat, 3.47 ; lecithine, 2.03 ; soluble salts, 0.93 ; insoluble salts, 0.02 ; traces of cerebrine. There is no essential difference between the chemical composition of the aqueous humor and the vitreous. The lens consists of globuline. In cataractous lenses a decrease of albumen could be demonstrated, as also the coagulation of a portion of the albumen.

1054. COBBOLD. Observations on certain optical illusions of motion. *Brain*, vol. iv, 1, 1881.

1055. DENISSENKO. Investigations on the nutrition of the cornea. *Virchow's Arch.*, Bd. lxxxvi, 3. 1. The cornea does not draw its nourishment from the anterior chamber (Knies, Ulrich), but from the surrounding blood-vessels in the sclera. Therefore the cornea is nourished in the same manner as every other tissue of the body. 2. Although the blood-vessels nourishing the cornea are situated in the sclera at some distance from the sclero-corneal margin, the nourishing fluid, after leaving them, is conducted through the fibres and fissures of the sclera to the corneal margin, where it enters the lacunar system, and is distributed throughout the entire thickness of the cornea, and then discharged into the anterior chamber. 3. The current does not flow from the centre to the periphery of the cornea (Knies, Ulrich), but from the periphery to the centre (Cohnheim, Szokalski), and not from behind forward (Knies, Ulrich), but from in front backward. 4. Therefore the stomata, which Klebs and others have demonstrated in the epithelium of Descemet's membrane, do not form the commencement of Recklinghausen's lymph-spaces for drawing nourishment from the anterior chamber, but serve to discharge the waste products. 5. This shows that the cornea does not draw its sustenance from the anterior chamber, but that, on the contrary, the waste products are discharged into the anterior chamber. 6. It therefore follows that the anterior chamber is an enlarged duct for discharging the aqueous humor. 7. Therefore it may be said that not the anterior chamber nourishes the cornea, but the cornea the anterior chamber.

1056. EMMERT. The relative size of after-images. With appended remarks by Zehender. *Klin. Monatsbl. f. Augenhk.*, Dec. The linear size of an after-image is equal to the linear size of the object multiplied by the distance at which the after-image is observed, *i. e.*, multiplied by the multiple of the distance at which the object was observed, the product divided by the simple distance. The area of the after-image (an object with four parallel sides) is equal to the length of one side of the object multiplied by the distance at which the after-image is seen, *i. e.*, multiplied by the multiple of the distance at which the object was seen, divided by the simple distance, and the quotient squared.

1057. JACKSON. Relation between the apparent movement of objects and the rotation of the eyes. *Lancet*, No. 17.

1058. JACKSON. Apparent movements of objects during involuntary movement of the eyes. *Ophth. Soc. of Great Britain*, Oct. 13, 1881. *The Ophth. Rev.*, p. 16.

1059. JORISSENNE. Les mouvements de l'iris chez l'homme à l'état physiologique. Mémoire couronné au concours de la Société de médecine de Gand. Paris, 1881, 52 pages with 1 plate and illustrations in the text.

1060. ORD. Unilocular diplopia. Ophth. Soc. of the United Kingdom. *Lancet*, No. 17.

1061. OUGHTON. The phenomena of double vision and touch. *Same journal*.

1062. RIEGER and VON FORSTER. Eye and spinal cord. *Grafe's Arch.*, Bd. xxvii, 3. It is hardly possible to give an abstract of this important paper. The principal point consists in demonstrating that the eye stands in close connection with nervous influences acting upon the blood-vessels.

1063. SCHMIDT-RIMPLER. The empiric theory of vision. *Sitzungsber. der Gesellch. zur Beförderung der ges. Naturwissensch.* zu Marburg, 1881, No. 4, Dec.

A child 3 years old had forgotten its sight so completely in consequence of an acquired opacity of the lens, that after being successfully operated it had to learn to see again. This is against the view of Dubois-Reymond, according to which the ability to interpret correctly the impressions on the senses is not exactly congenital, but comes suddenly, the child not being taught by experience in the way assumed by the empiric theory.

b.—RETINA, OPTIC NERVE, CENTRAL ORGANS, MUSCLES.

1064. EXNER. Investigations on the localization of the functions in the gray matter of man. Vienna, 1881, Braumüller, 180 pages, 25 plates. Chap. vii. The nerve-centre of the muscles of the eye in the gray substance, including the lev. palp. sup. Chap. x. The nerve-centre of the sense of sight.

1065. LANDOLT. Étude sur les mouvements des yeux à l'état normal et à l'état pathologique. *Arch. d' Ophth.*, vol. 1, 7. He describes a method of measuring the monocular and binocular fields of fixation and its results in normal, ametropic, and anisometropic eyes; also in insufficiency of the internal and external recti, and various forms of concomitant and paralytic squint. Numerous interesting observations with illustrations of the field of fixation demonstrate the value of the method in diagnosis and therapeutics.

v. MITTELSTÄDT.

1066. SZOKALSKI. The consequences of irritation of the optic nerve. *Przeegl. lek.*, 1881. Rep. in *C. f. A.*, p. 383. He opposes the proposition that every nerve of special sense reacts, when irritated in any way whatsoever, in its own peculiar way; for he asserts to have discovered that an irritation of the optic nerve does not necessarily produce the sensation of light. Schmidt-Rimpler has lately proven just the contrary.

1067. URBANTSCHITSCH. Observation of physiological soul-blindness. *Med. Jahrbücher*, Vienna, 1881, H. 3 and 4.

c.—COLOR-PERCEPTION.

1068. COHN. New methods of testing the color-sense by pseudo-isochromatic plates. *C. f. A.* He seeks to defend himself against the objections raised by Mauthner. V. Nos. 153 and 626 this bibl.

1069. COSMINSKY. The investigation of color-blindness. Lecture delivered before the medical society at Warsaw. *Wiatsch*, No. 16. In favor of Pflüger's method.

1070. DONDERS. Sur les systèmes chromatiques. *Ann. d' Ocul.*, Nov. and Dec., 1881. The separation into red- and green-blindness can be maintained. It is unjustifiable to consider those colors, which are wanting in the various forms of dyschromatopsia, as fundamental colors of the normal system.

1071. EMERY. La percezione endottica del colore del fondo del' occhio. *Ann. dell' Acad. delle Scienze*, vol. vi, 1881.

1072. FRANKHAUSER. Examination of the scholars of the high-school at Burgdorf for color-blindness. Ann. rep. of the high-school at Burgdorf at the close of the school year, 1880-81. Holmgren's and Pflüger's methods were employed. Stilling's plates are not always reliable, and can therefore not be recommended. Red-green blindness was found in 6.2% out of 177 scholars; 44 made mistakes, though not color-blind. It is advised to cultivate the color-sense at school; the system of Magnus was used for this purpose with good results in general.

1073. V. FLEISCHL. On the theory of color-perception. *Biol. Centralbl.*, No. 16, Nov. 30, 1881. No investigations, including the latest, have succeeded in disproving the theory of Helmholtz or proving that of Hering. On the contrary, some objections have been raised, especially by Knies, Macé, and Nicati, which are absolutely incompatible with the hypothesis of Hering. It is also difficult to understand why, if there are three kinds of substances for color-perception,—red-green, blue-yellow, and black-white,—only the first two should be wanting (red-green, blue-yellow blindness), and there is no case in which the black-white substance is missing. All objects should appear colored to such persons, without any shading in brightness. It seems unnatural to consider brightness as a special quality of the visual sense, as is necessary according to Hering's theory, which is entirely separate from the perception of color. We are accustomed to consider brightness only a degree of intensity of color, and not a special perception.

1074. GILLET DE GRANDMONT. Note sur un procédé expérimental pour la détermination de la sensibilité de la rétine aux impressions lumineuses colorées. *Rec. d'Ophth.*, 1881. In order to test the sensibility of the retina for colored light, Gillet uses a chromatoscope constructed by himself. It consists of a black disc with apertures, behind which either colored or white surfaces can be displayed. The eye to be examined gazes steadily at a point to one side of the disc; the perception of the colored surfaces, at first distinct, gradually disappears; if at this point the colored surfaces are replaced by white ones, they appear in the complementary colors. MARCKWORT.

1075. V. HIPPEL. Unilateral color-blindness. *Graefe's Arch.*, Bd. xxvii, 3. The tests applied by Hippel to his patient are unfavorable to the theory of Young-Helmholtz, and favorable to that of Hering.

1076. KOLBE. The most practical methods for testing the color-sense of large numbers of people. *C. f. A.*, Dec. Neither the methods of Holmgren nor Stilling suffice. Both methods should be employed simultaneously, and their use be made obligatory. A comparison of the statistical results obtained by the investigations of various authors is only possible if the examination is combined with a quantitative determination of the color-sense. For this purpose Weber's plate is recommended.

1077. KUHNT. On the colored induction of light. *Graefe's Arch.*, Bd. xxvii, 3. Every color can only induce its own quality. The color of the after-image of a disc of black velvet which has been gazed at for 45 seconds, is always the same as that of the disc itself. The color produced by successive induction is not due to contrast and erroneous judgment, but is the result of a reaction in the visual substance.

1078. MAGNUS. Colors and creation. Eight lectures on the relation of the colors to man and nature. Breslau, 1881, 290 pages and one chromo-lithographic plate. 1. The nature of color. Color is nothing existing objectively, but a subjective function. 2. Perception of color. Discussion of the theories of Young-Helmholtz, Hering, Preyer. 3. The biological functions of color. Colors have no fixed biological functions, but are collateral phenomena of other biological processes. 4. The color-sense of animals. It is undoubtedly true that animals have a perception of the various kinds of light, the nature of which, however, is unknown. Grant Allen, Carus Sterne (Ernst Krause), and others delegate to both man and animals the same power of perception of color, though this assertion is directly opposed to the conclusions obtained from physiology and anatomy. Such teachings are the result of philosophical speculation, and not of scientific investigation. 5. The development of the color-sense. The determination of this question now belongs to physiology and the natural sciences. 6. Color-blindness. 7. The æsthetics of color. They are based entirely on physiology. 8. The education of the color-sense.

1079. PARINAUD. Des troubles visuels qui diminuent l'aptitude à reconnaître les signaux colorés. *A. d' Ocul.*, 1881, Nov.-Dec. The power to distinguish colored signals may be reduced by the following conditions: *a*, congenital Daltonism; *b*, acquired true Daltonism; *c*, acquired false Daltonism; *d*, relative dyschromatopsia. Parinaud calls acquired false Daltonism a condition in which the perception of light is diminished and the power of distinguishing color is reduced, when the intensity of the illumination is diminished, while under usual illumination the color-sense is normal. By relative dyschromatopsia Parinaud means those conditions in which the perception of light and color is normal, while the refraction or refractive media have been altered. He proposes the use of the instrument described by himself (*Ann. d' Ocul.*, March and April, 1881), as it determines the perception of light and color, and the power of vision.

1080. PFLÜGER. Further observations¹ of color-blind persons. *A. f. A.*, vol. xi, 1. Pure red and green do not produce a specific sensation of color in color-blind persons, but only of neutral light, of gray. A person who has no specific perception of red, has none of green either.

1081. PONTAPPIDAN. Nomenclature of colors, and color-sense. *Ugeskrift for Lær.*, Kjöbenhavn, 1881, 4 r., vol. iv, No. 30. The author has examined the nomenclature of colors and color-perception of the inhabitants of the Sandwich Islands, and found that the Hawaiian language has exact names only for white, black, and red; the other appellations are indefinite, and green and blue bear the same name. The color-sense is well developed; of 394 men, and 103 women who were tested with Holmgren's worsteds, 5 were color-blind. The author has found the same results in every part of the globe, and discovered

the general law, that in the nomenclature of colors, both ancient and modern, blue and green are by far not as distinctly defined as the colors of the red end of the spectrum.

1082. PURTSCHER. A case of erythropsia after traumatic cataract. *C. f. A.*, Nov.

1083. SAMELSOHN. The question of a nerve-centre for color-perception. *Centralbl. f. d. med. Wissensch.*, 1881, No. 47. Typical left-sided hemianopia for all colors; within the defect all colors seemed gray. See No. 604, this bibl.

1084. SCHENKL. The association of words with colors. *Prager med. Wochenschr.*, 1881, No. 48.

1085. SZILÁGYI. On simultaneous contrast. *Centralbl. f. d. med. Wissensch.*, 1881, No. 47. Simultaneous contrast is produced without the influence of fluorescence of the refractive media, as Giraud-Toulon maintains. It is produced, not in the retina, but in the brain.

1086. VOLKELT. The colors and the soul. *Zeitschr. f. Philos. u. philos. Kritik.*, Bd. lxxix, 1, Leipzig, 1881. The transmutation of the quantitative differences between the irritation of the nerves, caused by the varying wavelengths of the ether, into a perception of the different colors is an action of the soul itself.

B.—ANOMALIES OF REFRACTION AND ACCOMMODATION, LIDS, LACHRYMAL APPARATUS, MUSCLES AND NERVES, ORBIT AND NEIGHBORING CAVITIES, CONJUNCTIVA, CORNEA, AND SCLEROTIC.

BY DR. C. HORSTMANN.

I.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

1087. SORMANI. Miopia. *Geografia nosologica dell' Italia*, Roma, 1881. The author discusses myopia and blindness in general, basing his remarks on the observations made by the Italian recruiting commission. The statements, though interesting, are of no value for the statistics of myopia, as only those cases are recorded which by the Italian law (*m.* $\frac{1}{4}$ and more) are relieved from military service. The number of recruits showing such degrees of myopia was 5,761 out of more than 2,000,000, or 2.8 per thousand. Southern Italy and the coast furnished most of them.

But as just in these regions frequently more than 70% of the recruits can neither read nor write, myopia acquired at school is in Italy out of the question. (This remarkable fact has already been observed by Mannhardt and the reviewer. They not seldom found the highest degrees of myopia in persons who never had been to school.)

The author has also measured accurately the depth of the orbit of twelve skulls. In brachycephalous skulls the average depth of the right orbit was 42.9 *mm.*, of the left 43.2 *mm.*; in dolichocephalous skulls 48.3 and 47.9 *mm.*

DANTONE.

II.—LIDS.

1086. LAGETSHNIKOFF. A rare case of elephantiasis palpebrarum. *Med. Uebersicht*, Bd. xv, p. 894. Both lids are very much enlarged; the upper hangs down to the nasal angle. The disease began in early childhood.

HIRSCHMANN.

1089. RICHON. Chancre induré de la paupière inférieure suivi d' accidents secondaires graves. *Gas. des Hôp.*, 1881.

1090. BAUDRY. Note sur un cas d' emphyseme des paupières. *Gas. des Hôp.*, 1881, 3, Dec.

1091. SQUARE, WM. Entropium senile. *Brit. Med. Journ.*, 1881, No. 26. Square cures senile entropium by applying sutures. Six cases with good results.

1092. BERGER. Ectropion considerable de la paupière inférieure. Greffe par transplantation d' un lambeau taillé dans la peau du dos, combinée avec la blépharoraphie. *Rev. d' Ocul. du Sud-Ouest*, No. 14, p. 324.

1093. CAUDRON, VIRGILE. Ectropion cicatriciel. Greffe hétéroplastique. Guérison. *Rev. d' Ocul. du Sud-Ouest*, No. 14, p. 332.

1094. MANDELSTAMM. A case of sarcomatous ectropium, with some remarks upon trachoma. *Arch. f. Ophth.*, Bd. xxvii, 3, p. 101. From the condition of the ectropionized lids, the author concludes that the tendency of the epithelium of the conjunctiva to become hypertrophic is great, not only when directly exposed to the air, but also when, in consequence of unknown injurious influences (dust, smoke, scrofula, barrack-air, etc.), trachoma develops. The hypertrophy of the epithelium, together with the hyperplasia of the adenoid tissue, is of primary importance in trachoma; perhaps the pertinacity of the disease may be ascribed to it. When the hypertrophy has once begun, it can cause at any time fresh irritations of the adenoid tissue.

1095. CRITCHETT, ANDERSON. A case of complete symblepharon successfully treated by operation. *Brit. Med. Journ.*, Dec. 10, 1881, p. 934. In this case the symblepharon resulted from a burn; the lower lid covered the greater part of the pupillary area. It was dissected away from the globe, and then two conjunctival flaps were formed and the exposed sclerotic covered with them. The result was a good one.

FITZGERALD.

1096. MAKLAKOFF. Operation for trichiasis. *Ann. d. russ. chir. Ges.*, No. 11. Maklakoff recommends the use of serres fines instead of sutures in operating for trichiasis.

HIRSCHMANN.

1097. ARLT. Ankyloblepharon (peculiare). *Ber. über d. 13, Vers. d. ophth. G.*, p. 126. In a child which could only half open the right eye, though there was no photophobia, a pale-red elastic membrane was found to be the cause, which in the right eye extended from the outer canthus to the centre, in the left as far as the inner third of the otherwise normal palpebral fissure. Not only the intermarginal portion of the upper and lower lids, but also the outer canthus of both eyes were normal. The globe was freely movable, and a probe could be passed between it and the membrane into the conjunctival sac behind the outer canthus. The membrane was said to have developed after an inflammation of the eyes when the child was eight months old, probably a croupous and membranous conjunctivitis.

1098. MEYER. Epithéliome de l' angle interne de l' œil gauche : ablation. Greffe dermique. Guérison. *Rev. d' Ocul. du Sud-Ouest*, No. 14, p. 320 ; *Bull. et Mém. de la Soc. de Chir. de Paris*, Nos. 8 and 9.

III.—LACHRYMAL APPARATUS.

1099. ARMAIGNAC. Considérations sur l' étiologie et la thérapeutique des affections des voies lacrymales. *Rev. d' Ocul. du Sud-Ouest*, Sept., Oct., Nov., 1881.

1100. ARMAIGNAC. Extraction par un nouveau procédé d' un fragment de sonde d' argent logé par accidents dans les voies lacrymales. *Rev. d' Ocul. du Sud-Ouest*, Aug., 1881.

IV.—MUSCLES AND NERVES.

1101. FANO. Sur les fonctions du muscle petit de l' œil chez l' homme. *Compt. rend. de l' Acad. des Sc.*, Jan., 1881.

1102. ULRICH. The etiology of convergent squint. A proposition to prevent it. Kassel, Theo. Fischer, 1881. During the time in which convergent squint is developing, considerable information can be gained in regard to its etiology and treatment. The cause of convergent squint is the great strain upon the accommodation. If this condition is eased, the excessive strain on the internal recti also ceases, as long as no organic changes have taken place within them. This, however, will not be the case when attended to at an early stage. The author, therefore, proposes the occasional use of convex glasses and instillation of a solution of eserine of $\frac{1}{4}$ — $\frac{1}{2}$ % in children with a tendency to squint. There are prospects of success only when the result for the moment is perfect.

1103. BJELOFF. Contributions to the knowledge of the conditions of dynamic equilibrium of the internal and external recti muscles in eyes with different states of refraction. *Inaug. Diss.*, 1881, St. Petersburg.

1104. BERRY. Clinical notes and remarks on two unusual forms of strabismus. *Ophth. Rev.*, vol. i, 1881, No. 46.

1105. LANDOLT. Disturbances of the movements of the eyes. *Rep. of the Intern. Med. Congr.*, London, Ophth. Section. In order to treat rationally and successfully disturbances of motility of all kinds, it is necessary to measure the monocular and binoculars fields of fixation and the strabismus-angle. These measurements are executed most easily by using a perimeter with a toothed board for fixing the head and a tangent-scale on the wall, as described by the author. The treatment should not be confined to one method alone, but should consist of a combination of all suitable to the case. They are : correcting glasses, electricity, orthopedy, operation, general treatment.

1106. E. NETTLESHIP. Case of paralysis of third, fifth, and sixth nerves, of four years' duration, in a girl æt. 14, the subject of inherited syphilis. *Trans. of Pathological Soc. of London*, xxxii, 13, 1881. The other evidences of hereditary syphilis were notched teeth, old keratitis, and prominent frontal eminences. There was perforation of the septum nasi. E. NETTLESHIP.

1107. E. GRÜNING. Traumatic ophthalmoplegia. *Med. Record*, Nov. 12. All the muscles of the left eye were paralyzed by a blow of the fist. The O. N.

showed no alteration with the O. S., but there was total blindness. G. thinks there must have been fracture of the pyramid of the orbit with laceration of the optic nerve.

SWAN BURNETT.

1108. ABADIE. On ophthalmic vertigo. *Intern. Med. Congr.*, London, 1881, Ophth. Section. Abadie describes a kind of vertigo, which seems to be due to a disturbance in the innervation of the muscles of the eye. It may attain a very high degree, and then the motion of the eyes appears checked to a great extent, especially upward.

V.—ORBIT AND NEIGHBORING CAVITIES.

1109. C. HIGGENS. On distension of the frontal sinuses. *Guy's Hosp. Reports*, vol. xxv, 27, 1881.

A report of four cases in H.'s practice, with critical remarks and citation of published cases and opinions. In Case 1, M., 32, there had been abscess in same place at æt. 7, and injury, followed by removal of dead bone from same place, æt. 16. Tumor noticed 8 months. Case 2, M., 13, no injury, swelling noticed 6 months. Case 3, F., 19, no injury, tumor 8 months. Case 4, M., 36; æt. 14 was kicked over his eyes, æt. 29 another injury by iron bar over orbit. Pain in L. supra-orb. region began two years later, together with some ptosis, and pain at pulley of supr. oblique; no swelling till 3½ years after he was first seen, or 5–6 years after second injury. All treated by free incision and establishment of an opening from floor of distended sinus into nose; result good in all. Remarking on the difficulty of diagnosis in this disease, H. makes the important, and probably new observation, that the swelling (when it has caused absorption of bone) *varies in size at different times of day*, being smaller after lying down for some hours; it always points *above* the tendo oculi.

E. NETTLESHIP.

1110. KRAMOSZTYK. A foreign body in the orbit. *Gas. lekarsk.*, 1881, p. 76. A man 45 years old was attacked with typhoid fever, shortly after having received a blow from the shaft of a wagon. The whole time he was ill he complained of severe pains in the eye. Three months later slight blepharospasm developed; the eye was deflected inward considerably. There was a small ulcer at the upper inner margin of the cornea, next to which a foreign body, firmly imbedded, was detected by the probe. It was extracted with difficulty and found to be a piece of wood 6 cm. long. The canal in which it lay had a smooth cicatricial surface, and bone was exposed. The convergent squint was caused by the formation of this canal, which extended inward along the internal rectus muscle. Vision was not perceptibly reduced.

HIRSCHMANN.

1111. NARKIEWICZ-JODKO. Cases of lesions of the eye of traumatic origin. *Gas. lek.*, 1881. After an insignificant injury an inflammation of the orbital tissue set in, which led to the formation of an abscess. The abscess was opened and a temporary improvement ensued, though there was soon a relapse. The patient, who went elsewhere, was treated expectatively. Three weeks later a second abscess opened spontaneously, and all the symptoms of disease disappeared, the eye, however was totally amaurotic, showing atrophy of the optic nerve. It follows, therefore, that in abscesses of the orbit, an active, not a waiting treatment must be adopted at an early date.

1112. CHAUREL. Quelques cas de perte unilatérale immédiate et persistante de la vue à la suite de traumatisme du crâne. *France Med.*, July 16, 1881.

1113. BERLIN. A case of injury of the optic nerve through fracture of the optic canal. *Ber. über d. 13. Vers. d. ophth. Ges.*, p. 81. The author observed at the autopsy of a suicide a fracture of the optic canal, which had severed the nerve not only within the canal but also within the brain.

1114. J. R. WOLFE. Aneurism of orbit (pulsating exophthalmus) following injury, cured by ligature of common carotid. *Lancet*, Dec. 3, 1881, (ii, 945.)

F., 22; symptoms began 3 months after a blow on L. eye, with pain and beating in the head, slight proptosis and bruit heard in orbit; 8 months after injury proptosis greater; a soft, pulsating tumor near inner canthus, with thrill and puffing bruit; pulsation stopped by pressure on carotid; papillitis with extreme venous engorgement. Vision somewhat defective; ulceration of cornea. Ligature of common carotid by Dr. Foulis, 8½ months after injury; full antiseptic precautions and catgut ligature. Pulsation stopped, and tumor much diminished. S. recovered perfectly and O.D. cleared. Four weeks after operation only slight proptosis. E. NETTLESHIP.

1115. HIGGENS. Case of vascular protrusion of the eyeball. *Trans. of the Med. Chir. Soc. of London*, vol. lxiv.

1116. SKREBITZKY. Case of anophthalmus with congenital cysts in the lower lids. *Klin. Monatsbl. f. Augenheilk.*, B. xix, p. 423. In a child 6 months old otherwise healthy and with a normal skull, the orbit was found absolutely empty. Globular tumors of the size of normal eyes protruded upward beneath the mucous membrane of the lower lids; fluctuation was easily perceptible. Either they were cysts of the lower lids or malformed eyes.

1117. OSTERWALD. A new case of leucæmia with bilateral exophthalmus due to orbital tumors. *Arch. f. Ophth.*, Bd. xxvii, 3, p. 203.

VI.—CONJUNCTIVA, CORNEA, SCLERA.

1118. SATTLER. The nature of trachoma and a few other diseases of the conjunctiva. *Ber. über d. 13. Vers. d. ophth. Ges.*, 1881, p. 18. See these ARCHIVES, vol. x, p. 459.

1119. VOSSIUS. The treatment of diphtheritic conjunctivitis. *Klin. Monatsbl. f. Augenheilk.*, Bd. xix, p. 418. Vossius recommends the local use of a 4-per-cent. solution of salicyl-glycerine in diphtheritic conjunctivitis.

1120. SCHAFFER. The treatment of the contagious diseases of the conjunctiva. *Wiener med. Presse*, No. 27. The author uses in blennorrhœa iodide of sodium internally, zinc-collyria, calomel and yellow ointment externally, and advises such patients to remain in a cold room.

1121. PRZYBYLSKI. Some thoughts on diphtheritic conjunctivitis and its connection with diphtheria and croup in general. *Pam. Tow. Lek. Warsz.*, 1881, vol. lxxvii, 3, p. 491. The author gives a short review of the development and present state of our knowledge of diphtheria in general, describes diphtheritic conjunctivitis, reports 80 cases of this kind, and draws conclusions as to the nature of the disease, the method of treatment, etc.

1122. KRANHIK. The cause of the diseases of the conjunctiva in the army. *Wratsch.*, No. 10, 1881. The causes are insufficient sleep, drill in the sun, too tight cravats and collars, besides bad air in the barracks, and diseases or irritability of the conjunctiva acquired before serving. HIRSCHMANN.

1123. H. S. SHELL. Autumnal conjunctivitis. *Med. and Surg. Rep.*, Nov. 5, 1881.

1124. FONTAN, J. Des adéno-papillomes de la conjonctive. *Rec. d' Ophth.*, Dec., 1881. A tumor about the size of a pea was found on the sickle-shaped edge of the semilunar fold, with a thin stem about 3 mm. long; it was removed by thermocautery. Its surface consisted of papillæ covered with pavement epithelium. The tumor was traversed by fascicles of connective tissue, between which lay acinous glands. MARCKWORT.

1125. FIALKOWSKY. A case of papulous syphilis of the conjunctiva bulbi. *Wratsch.*, No. 5, 1881. After a syphilitic angina and condylomata at the anus, a nodule resembling a phlytænula developed on the conjunctiva of the globe 3-4 mm. downward and inward from the cornea, which ulcerated on the fourth day, and disappeared without any local treatment after 14 subcutaneous injections of sublimate (1 cgrm. per dose). HIRSCHMANN.

1126. DUJARDIN. Tumeur sous-conjonctivale de nature épithéliale. *Journ. des Sc. méd. de Lille*, Nov., 1881.

1127. UHTHOFF. A case of unusual degeneration of the human conjunctiva. *Virchow's Arch.*, Bd. lxxxvi, p. 322.

1128. PANAS. Considérations sur la nature et le traitement de la kératite interstitielle diffuse. *Arch d' Ophth.*, vol. i, No. 7, 1881. Diffuse keratitis is much more common in rhachitis and scrofula than in hereditary syphilis. Panas makes the distinction of an acute and a chronic form. In the former the cornea is highly irritated, and numerous blood-vessels are formed. In one such case peritomy produced a favorable result, but in another sclerosis of the cornea ensued. In treating the chronic form he advises vapor and subsequent massage; iridectomy, sclerotomy, and paracentesis act only by causing the formation of blood-vessels at the wound. V. MITTELSTÄDT.

1129. MIKUCKI. Eserine in keratitis. *Medycyna*, 1881. Mikucki recommends the use of eserine in ulcers of the cornea, especially at the periphery, basing his advice on the clinical history of 12 cases.

1130. KLEIN. The use of yellow ointment in diseases of the eye. *Wiener med. Presse*, No. 43. Klein used yellow ointment in every disease of the cornea with good result.

1131. KRAMSZTYK. Neuroparalytic keratitis. *Medycyna*, 1881. Kramsztyk discusses the identity of the so-called neuroparalytic keratitis with other affections of the cornea which occur in severe forms of disease, when the patients remain unconscious for some length of time with eyes half open. They are due to the loss of moisture of the cornea.

1132. SBORDONE. Il ferro revente nelle ulcere della cornea. *Movimento med. chir.*, Anno xiii, fasc. 12, 1881. Clinical history of 4 cases of deep ulcers of the cornea, in which the ferrum candens was used with good result.

DANTONE.

C.—IRIS AND UVEAL TRACT, GLAUCOMA, SYMPATHETIC OPHTHALMIA, REFRACTIVE MEDIA (LENS AND VITREOUS BODY), RETINA AND FUNCTIONAL DISTURBANCES, OPTIC NERVE, INJURIES, FOREIGN BODIES (PARASITES), OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

BY DR. A. NIEDEN.

I.—IRIS AND UVEAL TRACT.

1133. ANGELUCCI. Su un caso di tubercolosi dell'occhio originata nelle tessitura trabecolare del canale del Fontana. *Gaz. med. di Roma*, Dec., 1881. The tumor was observed in an otherwise healthy girl of 13, and partly filled the anterior chamber, partly formed an ulcer at the outer sclero-corneal margin, where an incision had been made. The tuberculous nodules were mainly located between the ciliary processes and ciliary muscle. Secondary changes only had taken place in the iris, ciliary processes, and choroid; the retina was detached. Blindness set in 4 months after the beginning of the disease, and then the globe was enucleated. DANTONE.

1134. V. FORSTER. Albinism. *Zeh. klin. Monatsbl.*, Bd. xix, p. 389. Case of a girl, whose father was a dark blonde, the mother a brunette; 2 brothers and the children of a sister of the mother albinos. No consanguinity in the family; myopia of a higher degree, V considerably reduced, excellent perception of color down to the finest shades. Both discs blackish gray and surrounded by a broad white scleral ring. A congenital anomaly of formation is assumed as the cause.

1135. GOUVÊA HILARIO (de Rio Janeiro). Case of aniridia congenita of both eyes, with deficiency of the ciliary body and anterior part of the choroid. *Transact. of the Intern. Med. Congr.*, London, vol. iii, p. 120. Man 23 years old; complete absence of iris in both eyes, lenses dislocated upward, so that there is an aphakic space at the lower corneal margin. No sign of the presence of ciliary processes, nor of the anterior part of the choroid, while the posterior part is more or less normal, as are also the blood-vessels of the retina.

1136. HANSELL. Preliminary communication of experiments in vaccinating syphilis upon the iris and cornea of the rabbit. *G. A. f. O.*, Bd. xxvii, 3, p. 93. The experiments were made with the thin purulent contents of a gumma which was still intact. On the 25th day after vaccination iritis set in in both eyes, together with the growth of granulomas resp. papules and gummata in the ciliary body. When only the cornea was vaccinated, several small, very vascular nodules developed. The animal died after six months of marasmus. The lungs and liver were infiltrated with small tumors resembling tubercles. The same result ensued in about four weeks, when the secretion from plaques muqueuses, well-known for its high infectious power, or from particles of a still intact sclerosis was used. A characteristic difference between the syphilitic and tuberculous nodules consists in the much greater vascularization of the former, and in the tendency of the latter to caseous disintegration. Vaccinating with lupus produced no result whatever.

1137. V. HIPPEL. 4 cases of perforating sarcoma of the choroid. *Ber. d. ophth. Klinik zu Giessen*, 1881, Stuttgart, F. Enke, p. 35. 1. Woman 47 yrs. old, right eye, relapse. 2. Man 67 yrs. old, left eye, vascular round-cell sarcoma; nothing known of a relapse. 3. Woman 58 yrs. old, right eye, melano-sarcoma; no relapse after six mos. 4. Person 71 yrs. old, right eye. Relapse after a year in the lower lid, and a tumor in the right submaxillary region, also of a melano-sarcomatous nature.

1138. HOSCH. Primary sarcoma of the iris. *C. f. A.*, Bd. v, p. 361. It has developed in a person 66 yrs. old, at a spot upon the iris where a pigmentation of darker brown has existed ever since his youth. The tumor proved to be a pigmented spindle-cell sarcoma, which had not yet touched the choroid and ciliary body. The author assumes with Knapp the probability of a conversion of the normal pigmented hyperplastic tissue in the neoplasm during the later years of life. The newly formed pigment undoubtedly comes from the blood-vessels.

1139. HOSCH. A case of gumma of the ciliary body. *C. f. A.*, Bd. v, p. 365. The author adds six cases which were overlooked by Seggel in his bibliography in these ARCH. Patient 37 yrs. old; 7 months after infection a rapidly growing tumor developed under violent symptoms of inflammation of the iris and choroid, and soon reached the size of a small cherry. Energetic inunction (120 grms. of blue ointment and one grm. calomel were used daily) gradually reduced the size of the tumor until it finally disappeared entirely.

1140. MANDELSTAMM. Case of sarcoma of the choroid. *Petersb. med. Wochenschr.*, No. 17, 1881. The case, already reported in No. 827, was not one of a child, but of a man 30 yrs. old.

1141. MASSE. Des tumeurs perlées de l'iris. *Rec. d' Ophth.*, July, Aug., 1881. After an injury of the eye combined with a penetrating wound of the cornea, sometimes cysts develop upon the iris, sometimes solid tumors. Many intermediate stages exist between these two varieties, the serous translucent cysts and the epithelial pearly tumors. Some cysts are almost entirely solid and filled with fat and epidermis cells; the pearly tumors also contain epithelial cells, fat and crystals of cholesterine. The want of an enveloping membrane in the pearly tumors, which the author doubts, constitutes only an apparent difference. Masse reports a case of a pearly tumor of the iris, observed by himself, which had developed around three lashes; they had entered the anterior chamber through a wound and lay upon the iris. The author has shown by experiments upon rabbits, that when the lashes are deprived of the bulbs and brought into the anterior chamber, they do not cause the development of tumors of the iris; these are due to the presence of the bulb or small particles of the epidermis or conjunctiva. After introducing a piece of conjunctiva into the anterior chamber a cyst and pearly tumor of the iris developed in the same rabbit.

MARCKWORT.

1142. MASSE, E. De la formation par greffe des kystes et des tumeurs perlées de l'iris. Bordeaux, A. Bellier, 1881. Treats of the same subject.

1143. RYMARKIEWICZ. Case of polycoria in the left eye. *Medycyna*, 1881. The normal pupil was somewhat displaced downward and inward, the second pupil was situated slightly upward and outward, was of an oval shape, with a

major diameter of 2 mm. and a minor of 1 mm. The pupil of the right eye is slightly dislocated downward.

1144. ULLMANN, GY. Un cas d'iritis diabétique. *France Méd.*, No. 44. Oct. 13, 1881.

1145. WICHERKIEWICZ. Traumatic or syphilitic irido-cyclitis? *Przeglad lekarski*, 1881. In a case in which a piece of gun-cap had penetrated the cornea, iris, and capsule of the lens, symptoms of a syphilitic character developed. Under antisyphilitic treatment the symptoms of inflammation disappeared and V rose to $\frac{1}{4}$, thus showing that the foreign body had not induced the inflammation.

II.—GLAUCOMA.

1146. DEHENNE. De la sclérotomie. *Union méd. de Paris*, 1881.

1147. PRIESTLEY-SMITH (Sheffield). Acute glaucoma following concussion, cured by eserine. *Transact. of the Ophth. Soc. of the Unit. Kingd. The Lancet*, No. 25.

1148. SPENCER WATSON. Case of eyeball tension treated by sclerotomy. *Trans. of Clinical Soc. of London*, xiv, 5, 1881. F. 46, R. sclerotomy for acute glaucoma of 48 hours' duration, + T₂. Section rather small and followed by slight prolapse of iris and bulging of scar. V improved from fingers to 4 Jaeger (with + $\frac{1}{4}$) and $\frac{1}{8}$; 4½ yrs. later V 4 Jaeger and $\frac{1}{8}$. Threatened glaucoma in L. kept in check > 4 years by eserine. O. D. of R. eye was pale soon after operation, and four years later was "pale and excavated."

E. NETTLESHIP.

III.—SYMPATHETIC OPHTHALMIA.

1149. KEYSER, P. D. Recovery from sympathetic ophthalmia. *Med. Bull.*, Philadelphia, vol. iii, No. 10.

1150. STORY and ABRAHAM. Micro-organisms in destructive ophthalmitis. *Brit. Med. Journ.*, Dec. 24, 1881, p. 1019. The authors point to the influence of micro-organisms in sympathetic ophthalmia.

IV.—LENS.

1151. ARLT. Spontaneous rupture of the anterior capsule of a cataractous lens. *Ber. d. Heidelb. ophth. Ges.*, 1881, p. 130. A cataract had slowly developed in a myopic woman, 34 years old; seven years earlier detachment of the retina had taken place. The spontaneous rupture of the capsule happened during the night. A linear section was made and a portion, consisting of cholesterine and fatty lenticular substance, removed. The eye remained good.

1152. CARRERAS-ARAGÓ. Lesion of the cornea, traumatic cataract, presence of a fragment of gun-cap in the lens, extraction of the foreign body and the lens, recovery. *Revista de Ciencias Médicas de Barcelona; C. f. A.*, Bd. v, p. 343. Extraction was performed 36 hours after the injury, when the lens was already perfectly opaque.

1153. CRITCHETT. Practical remarks on cataract. *The Ophthalmic Review*, vol. i, Dec., 1881, p. 21. C. divides his subject into two heads: 1.

Cataract during its period of formation. 2. Cataract when it has so far arrived at maturity as to justify operative interference. The first of these he then discusses under the head of "Preliminary Treatment of Cataract." He thinks we are too apt to treat cataract patients merely as subjects for operation, and that, consequently, they are often led to seek the advice of unscrupulous pretenders, who either promise to remove the opacity or to arrest its progress. He recommends a constant surveillance of the case from the time the opacity is clearly made out. He next considers the question as to how far it is expedient to inform the patient of the existence of the disease during its early stages. He concludes that it is impossible to lay down any hard or fast rule as regards this, for each case must be dealt with, as far as the exercise of judgment will permit, according to its own special requirements. With reference to the question as to what can be done for the patient in the way of palliative treatment, C. speaks of good results being often obtained by the employment of stenopœic glasses, with or without magnifying power. As regards the use of atropine, it is impossible to lay down any rule, but as a matter of policy, he inculcates discretion in prescribing it, and insists upon the importance of always ordering a weak solution, and never instilling it into both eyes at once. FITZGERALD.

1154. GOLDZIEHER. Ossification in the periphery of the lens. *Ber. d. 13. Heidelb. ophth. Ges.*, 1881, p. 155. In a globe enucleated on account of phthisis dolorosa the anterior surface of the lens was found covered with an osseous capsule. Total detachment of the retina and choroid due to the contraction of the cyclitic tissue.

1155. JANY. Contributions to the knowledge of diabetic cataract and its operation. *Deutsche med. Wochenschr.*, No. 49, p. 665. The author argues, as in a former paper, against considering diabetic cataract as a special form, at least not in older persons, and refers to a reported case. In young persons also they do not present any characteristic symptoms, although the rapid bilateral development would create suspicion. The operation is not contra-indicated even in cachectic individuals.

1156. PURTSCHER. A case of erythropsia after traumatic cataract. *C. f. A.*, Bd. v, p. 333. The cataract was absorbed spontaneously and completely. The pupil was perfectly black $2\frac{1}{2}$ months after the injury, $V = \frac{1}{2}$. One morning 5 months later he saw all objects red, and this continued for 3 days. Two weeks later, after being much heated, the same phenomenon without any ophthalmoscopic changes. $V = \frac{1}{2}$. Report of a second similar case in senile cataract.

1157. RYMARKIEWICZ. Case of congenital partial cataract. *Medycyna*, 1881. Cataractous opacity in the upper inner quadrant of the lens of a person 22 years old, extending in shape of a sector almost to the centre of the lens.

1158. SCHÄFER (Heidelberg). Case of congenital unilateral zonular cataract. *Zeh. klin. Monatsbl.*, Bd. xix, p. 445. The fourth case thus far reported; observed in the left eye of a girl 6 years old, without any symptoms of rhachitis in the bones. The other eye was perfectly normal, as in the two cases reported by Heuse in *C. f. A.*, Bd. iv, p. 177. The peripheric opacities corresponded almost exactly to the stellate configuration of the lenticular sutures, as they are seen in the new-born.

V.—VITREOUS BODY.

1159. GIRAUD-TEULON. Contribution à l'étude de l'électrothérapie dans le traitement des opacités du corps vitré. *Bull. de l'Acad. de Méd. de Paris*, Séance, Oct. 18, 1881.

VI.—RETINA AND FUNCTIONAL DISTURBANCES.

1160. ABADIE. Traitement du décollement de la rétine par la galvano-puncture. *Soc. de Chir.*, Séance, Nov. 30, 1881. *Prog. Méd.*, 1881, No. 49, et *Gaz. Héb.*, Dec. 9, 1881. Detachment of the retina frequently has a local cause; it is therefore open to surgical treatment. Abadie recommends galvano-puncture with a platinum knife for this purpose. The subretinal fluid is allowed to escape through an incision, so that the retina can re-adapt itself. The inflammation which then sets in is supposed to fix the retina in its position. Eight cases were treated; six chronic ones with transient good result, two cases of limited detachment with "satisfactory" result. As the tension was permanently reduced in these cases after the operation (perhaps without galvano-puncture, from the detachment.—REVIEWER), the author thinks of treating glaucoma in this way. MARCKWORT.

1161. ALEXANDER. Ischæmia retinæ. Cured by nitrite of amyl. *Deutsche med. Wochenschr.*, No. 40, 1881.

1162. ALEXANDER. Retinitis proliferans. Report of a case. *Deutsche med. Wochenschr.*, No. 40, 1881.

1163. BRAILEY, W. A. Some points relating to intra-ocular glioma. *Guy's Hosp. Reports*, vol. xxv, 497, 1881. The glioma cells are probably derived from the nuclei of the neuroglial basis-substance, not from the nuclei of Müller's fibres, nor from the true nerve elements; and when it invades the O. N. the connective trabecles remain free from infection. The vessels in glioma, unlike those in sarcoma, are surrounded by lymphatic sheaths, the cells contiguous to which are smaller and stain better than the more distant ones. Increase of neuroglial nuclei is observed in advance of glioma columns invading the O. N.; but when the growth invades the choroid there is no increase of nuclei in advance of it. B. thinks the neuroglial nuclei of O. N. take on the properties of the glioma cells. The *lam. crib.* is the chief obstacle to the invasion of the O. N., the growth being rapid when it has been passed. B. makes brief but important remarks on the conditions liable to be mistaken *during life* for glioma ("pseudo-glioma"). Of such conditions he mentions: (1.) Chronic irido-cyclitis, with formation of connective tissue in anterior part of vitreous, causing traction-detachment of retina and retraction of base of iris (clinically, this appears to be the commonest form.—REV.); (2) rarely connective-tissue growth from O. D.; (3) "spontaneous suppurative hyalitis" leads to detachment of retina; (4) rarely, spontaneous diffuse uveitis. Though T is nearly always — in pseudo-glioma, it is very rarely +; + T therefore does not invariably prove true glioma. E. NETTLESHIP.

1164. V. HIPPEL. Case of perforating gliosarcoma, tumor of the parotid gland and the ulna. *Ber. d. ophth. Klinik z. Giessen*, 1881, Stuttgart, F. Enke, p. 40. Girl, 8 years old; beginning observed three years ago; perforated a year ago. Exenteration of the orbit.

1165. V. HIPPEL. Case of hemianopsia homonyma dext. and heteronyma lateralis. *Ber. d. ophth. Klinik z. Giessen*, Stuttgart, F. Enke, 1881, p. 28.

1166. J. HUTCHINSON. On retinitis pigmentosa and allied affections, as illustrating the laws of heredity. *Ophth. Rev.*, vol. 1, Nov., 1881, p. 2. After treating of the disease in general, the author reports his experience in regard to the influence of consanguinity upon the development of retinitis pigmentosa. He possesses the data of 23 persons or their families. Eight of these sprang from marriages among relatives, among whom there was no record of a previous case of the kind. Three of these patients were partially or completely deaf. In four of the eight cases only one person was affected; ten times, more than one member of the family was affected; twice, three children; 8 times, two children. In ten cases no consanguinity in the family could be proved by anamnesis, and among these, in five cases, two members of the family were affected. The author thinks that consanguinity is undoubtedly an important factor in the development of ret. pigmentosa, as it is for deaf-mutism and idiocy.

E. NETTLESHIP.

1167. J. HUTCHINSON. Retinitis hæmorrhagica, especially in its relation with gout. *Med. Times and Gazette*, Dec. 10, 1881, ii, 675. Considerations and conclusions based on 24 cases (including the case in Jaeger's Hand Atlas, pl. xiv, fig. 65). Of this number 12 had had gout, 5 others were probably gouty, and in 7 no gouty history was obtained; 9 were over 60 years old, none less than 45; 13 males, 11 females. One eye affected in 17; both in 7. Gout probably predisposes to this affection through the medium of disease of blood-vessels, and "an incomplete thrombosis of the vena centralis" is probably the actual cause of the attack, suddenness of onset and asymmetry being in favor of this view. It differs from the relapsing intra-ocular bleeding of young adult males. H. refers to the possible connection of this latter disease, and also of hæmophilia, with gout, by the hereditary transmission of arterial disease.

E. NETTLESHIP.

1168. MACHECK. Retinitis pigmentosa. *Pracglad Lek.*, 1881. Of seven children of consanguineous parents, five are affected with ret. pigmentosa, hemeralopia, and atrophy of the optic nerve. The other two children (daughters) are well, and their children have normal eyes. Symptoms of hemeralopia first manifest themselves after the 10th year; the only boy became totally blind when 18 years old, while the sight of the four daughters was still moderately good in their 20th year. The eyes were mostly myopic, 5-9.5 D; all had nystagmus. The retinal deposits were accompanied in two cases by acute inflammation of the choroid, after strychnine had been tried for a time. Color-blindness was observed in 3 cases—once complete, twice partial.

1169. ST. MARENITSCH. Unilateral diffuse syphilitic retinitis, with complete loss of sight, cured in 48 days by the use of iodine and mercury. *Prot. d. med. Ges. in Wilna*, 1881, No. 3.

HIRSCHMANN.

1170. MAS. An interesting case of amaurosis due to hysteria. *La Union de las Ciencias Médicas de Cartagena*. Two successive attacks of amaurosis in consequence of hysterical eclampsia without any ophthalmoscopic changes, the one lasting 5, the other 31 days, the amaurosis disappearing suddenly each time. These cases also are open to doubt.

1171. MULES (Manchester). Retinal peri-arteritis. Ophth. Soc. of the United Kingdom. *The Lancet*, No. 25.

1172. OELLER. Hyaline degeneration of the blood-vessels as the cause of saturnine amblyopia. *Virchow's Arch. f. path. Anat.*, Bd. lxxxvi, pp. 329-359.

1773. REICH. Fall on the back of the head, large scotoma, partial neuroretinitis, complete restitution of the power of vision. *Wöchentl. klin. Zeitung*, No. 17. HIRSCHMANN.

1174. REID and HUNTER. Embolism of central artery of left retina. *Glasgow Medical Journal*, Oct., 1881. An ordinary case of embolism with partial recovery, the important point being the history of numerous attacks of temporary total blindness of same eye, lasting from half an hour to two hours, and usually coming on after severe exertion; at least twelve such attacks occurred in the three months preceding the final "embolism."

(Cf. LORING, *Amer. Jour. Med. Sci.*, April, 1874; and Nettleship, *Brit. Med. Jour.*, June 14, 1879.—REV.) E. NETTLESHIP.

1175. SCHUBERT. Case of syphilitic retinitis. *C. f. A.*, Bd. v, p. 329, and *cfr.* this index, No. 391. Uncomplicated case of syphilis presenting the ophthalmoscopic changes seen in partial hemorrhagic retinitis, in which the hemorrhages do not attend the arteries, but belong to the last branches of the veins. At the same time there is a considerable diminution of the volume of the principal veins in some places, probably due to infiltration of the perivascular lymph space, while the arteries are perfectly normal. Cured by antisyphilitic treatment.

1176. SCHWEIGGER. The use of strychnine, with remarks on visual disturbances due to hysteria. *Zeh. kl. Monatsbl.*, Bd. xix, p. 415. The visual disturbance is simply due to the fact that the person is under the impression of being blind in one eye. When the contrary is to be proven by means of the prism and stereoscope, we must be on our guard not to let the patient become conscious of the object of the proceedings.

1177. SECONDI. Sopra un caso non ancora pubblicato di guarigione del distacco retinico. *Boll. d'Ocul.*, vol. iv, 3, Nov., 1881. Puncture after v. Graefe. The detachment was partial. Recovery, which could still be demonstrated two years later. DANTONE.

1178. PRIESTLEY-SMITH. Retinit. pigment. connected with a history of maternal shock. *The Ophthalmic Review*, vol. i, Dec., 1881, p. 30. In the history recorded by S. there was no constitutional nerve disorder in the earlier generations, and no consanguineous marriage. The mother of the cases he relates had borne two healthy children. She suffered a severe nervous shock during the early months of her third pregnancy; the child, and all the subsequent children, excepting one which died in infancy, developed retinitis pigmentosa with partial deaf-mutism. FITZGERALD.

1179. UNTERHARNSCHEIDT. The development of detachment of the retina in myopia. *Berl. klin. Wochenschr.*, No. 40, 1881, p. 585. The author concludes: If the ciliary muscle is suddenly relaxed when powerfully contracted (especially when wrong glasses are used or objects are brought excessively near), a reduction of the tension of the vitreous body ensues, which for the moment

is considerable, and which cannot always be compensated for by a corresponding contraction of the eyeball, because the increased tension, the bulging and its consequences have diminished the elasticity. As the elasticity of the scleral tissue, which acts as a regulator, fails here, the law of the "horror vacui," so to speak, comes into play, which suffices, when there is the predisposition, to detach the stretched retina from the choroid, whose connection with the retina has been loosened. If the accommodative strain continues, the slight elevation may develop into a bullous detachment of the retina. As the increased intra-ocular tension which accompanies the accommodative action also causes absorption of the vitreous humor, it becomes mainly the part of the stream of diffusion which sets in when the accommodation is suddenly relaxed to fill the vacuum created. The compensating fluid from the blood-vessels of the choroid would then increase the detachment, as the retina is no longer any obstacle. The author then discusses the therapeutics and prophylactic measures.

1180. DE VINCENTIIS. Sui gliomi della retina. *Movimento*, fasc. 9-10; published also in the *Ann. d' Ottalm.*, vol. x, 425.

VII.—OPTIC NERVE.

1181. ALEXANDER. Neuritis of the optic nerve. Case. *Deutsche med. Wochenschr.*, No. 40, 1881.

1182. CHAUVEL. Névrite optique double avec myélite aigüe temporaire. *Bull. de la Soc. de Chirurg.*, p. 512, 1881.

1183. W. EDMUNDS. Perineuritis optica. Ophth. Soc. of the Unit. Kingd. *The Lancet*, vol. ii, No. 17, 1881. In a girl 8 years old, who had been run over by a cab and died 24 hours later, in consequence of a fracture of the base of the skull, which did not extend into the optic canal, a dense infiltration between the sheaths of the optic nerve was found. The surface, especially of the nerve, was inflamed; slight choked disc. In all probability the meningeal exudation had entered directly the intervaginal space.

1184. GALEZOWSKY. Des thromboses vasculaires amenant des névrites optiques ou des signes d'embolie. *Transact. of the Internat. Med. Congr.*, London, vol. iii, p. 58. Among 99 cases of embolism the heart and its action were perfectly normal in 13 cases; but in 3 cases there could be shown a connection between the arterial embolism and pernicious malaria, in 3 with syphilis, once with a fall on the back of the head, twice with a severe mental shock, and in one with aortitis.

1185. C. HIGGENS. Three cases of simple atrophy of discs in the same family. *Lancet*, Nov. 19, 1881, vol. ii, 869. The 4th, 5th, and 8th children of a family of 10, born alive. S. began to fail at æt. 15 years, in the 4th, 11 in 5th, and 10 in 8th. No other symptoms than simple atrophy of discs with almost blindness; failure rapid in 4th and 8th, slow in the 5th. Mother, symptoms of syphilis soon *after* birth of No. 4. Nos. 6, 9, and 10 healthy; No. 7 died almost at birth; between Nos. 4 and 5 there were several miscarriages. Retinal blood-supply below normal. H. thinks the atrophy due to disease of blood-vessels.

E. NETTLESHIP.

1186. V. HIPPEL. Embolism of the central retinal artery. *Ber. d. ophth. Klinik zu Giessen*, 1881, Stuttgart, F. Enke, p. 25. Sudden amaurosis of the

right eye in a person 30 years old without any disease of the heart or blood-vessels and without any affection of the kidneys. The one main arterial branch was devoid of blood here and there, and filled with some small red cylinders which slowly moved in a centrifugal direction. About one month later atrophy of the disc was plainly visible. The red spot at the macula was not observed.

1187. PONCET (Cluny). Myxome fasciculé du nerf optique. *Arch. d' Ophth.*, vol. i, No. 7, 1881. The author examined a tumor of the optic nerve, removed by v. Wecker from the left eye of a girl 16 years old. Visual disturbance in this eye when 3 years old, amaurosis for the last six years. The atrophic globe with the lids was united to the tumor, which was about the size of an orange. After detaching the anterior portion puncture at a point of fluctuation, when a large quantity of a yellowish transparent fluid was discharged. The whole neoplasm was confined to the subdural space, and consisted of a central round portion including the optic nerve from the entrance of the central artery to the optic foramen (22 mm. broad, 27 wide), and the surrounding hypertrophic arachnoidal tissue, which showed a cystoid degeneration. The nerve fibres were replaced by mucous tissue containing a great variety of cells within a reticulum, the walls of which consisted of the finest nucleated fibrils united in fascicles; these fibrils differ from connective tissue mainly in coloring, and are thought by the author to be derived from the cells of the neuroglia.

V. MITTELSTÄDT.

1188. SYMPSON. Double optic neuritis with cerebellar tubercle. *Ophth. Soc. of the Unit. Kingd. The Lancet*, vol. ii, No. 17. In a child 7 years old, which was suffering from albuminuria after scarlet fever, and which had received a severe injury of the skull one year before entering the hospital, headache, vomiting, and optic neuritis in both eyes, which slowly developed into atrophy. The autopsy showed marked hydrocephalus of the ventricles and tuberculous infiltration of the cerebellum.

1189. TH. WIETHE. Case of congenital deformity of the optic disc. *These ARCHIVES*, vol. xi, p. 70. In a patient with glaucoma in the right eye, the papilla of the left, which was hypermetropic to a high degree, and whose V— $\frac{1}{4}$, showed two blackish depressions of an elliptic shape within the substance of the optic nerve: one at the nasal end of the horizontal, the other at the lower end of the vertical diameter. The course of the blood-vessels across and out from the depressions was very strange. The author is inclined to assume a checked development.

1190. E. WOOD-WHITE (Birmingham). Embolism of central artery. Re-establishment of the circulation witnessed with the ophthalmoscope. *Ophth. Rev.*, vol. i, 1881, p. 49.

VIII.—INJURIES, FOREIGN BODIES (PARASITES).

1191. BECKER. Injuries of the membranes of the eye. *Inaug. Diss.*, Bonn, 1881.

1192. DAGUENET. Retinite traumatique. *Record d' Ophth.*, Dec., 1881. A soldier fell upon a tent-post with the outer side of the left orbit. Condition three weeks later: cornea and anterior chamber normal, subluxation of the

clear lens, numerous opacities of the vitreous, fundus veiled ; papilla indistinct, as it is covered by a whitish exudation ; two large ecchymoses in the retina, above the exudation no deposit of pigment, perception of light. Two weeks later, condition the same. 74 days later the exudation was surrounded by pigment, disc whiter than normal. Patient was not seen again. MARCKWORT.

1193. GALEZOWSKY. Des cataractes traumatiques. *Rec. d' Ophth.*, Dec., 1881, and Jan., 1882. General introduction. A foreign body in the lens frequently causes no trouble, therefore extraction should only be performed in those cases where the foreign body is clearly visible. It should first be extracted with a pincette or curette, and then the lens should be removed. In a patient, 38 years old, with subluxation of a traumatic cataract, Galezowsky wanted to perform an extraction. When the counterpunction was made, a considerable quantity of thin vitreous escaped. Galezowsky therefore withdrew the knife to the centre of the pupil, divided the capsule by a vertical incision, and then drew the knife from the anterior chamber. Good result.

1194. V. HIPPEL. Cysticercus in the vitreous body. *Ber. d. ophth. Klinik zu Giessen*, 1881, Stuttgart, F. Enke, p. 24. Eye free from irritation or pain, remnants of a former irido-choroiditis, perhaps due to an infection with recurrent fever. No operative removal.

1195. V. HIPPEL. Foreign body in the posterior section of the globe. Case. *Ber. d. ophth. Klinik zu Giessen*, 1881, Stuttgart, F. Enke, p. 55.

1196. FERNANDEZ, SANTOS. Amaurosis as the result of an injury in the periorbital region. *Crónica ophth. di Barcelona*, vol. i, 1881. The author concludes from his observations (four cases) and experiments, that amaurosis after an injury of the periorbital region is generally due to a lesion of the brain. Amaurosis with atrophy of the disc caused by it, is incurable.

1197. TALKO. Injuries of the eye in recruits. *Gaz. lekarsk.*, 1881. C. f. A., Bd. v, p. 386. Injuries of the cornea by caustic potash, nitrate of silver, or bites of leeches, are frequently found among the Russian conscripts. An artificial trauma of the eye was proven in 16 cases out of 235 who were suspected of simulating, or 7%.

1198. I. C. WORDSWORTH. Defects of vision attributed to railway collision. *Proceedings of the Medical Soc. of London*, vol. v, 310, 1881. W. refers only to functional derangements (collectively—asthenopia) following severe shaking. He has never seen permanent defects of V, nor structural changes in the eyes in such cases. He has often found hypermetropia.

E. NETTLESHIP.

1199. ZSIGMONDY. Attempted suicide with a revolver. *Wiener med. Presse*, No. 46, p. 1449. Shot in the right temple with a revolver ; no reaction of right pupil, cornea dull, injured superficially, only quantitative perception of light. Ball in the cranium.

IX.—OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

1200. ARADIE. Du vertige oculaire. *Le Progrès Méd.*, No. 53, 1881 ; No. 1, 1882. Man 25 years old, the mobility of whose eyes in all directions is limited to a high degree and every effort attended with great dizziness

which, in upward movements, is almost increased to syncope. Ophthalmoscopic appearance and V normal. Cured by extr. bellad. and hydrotherapeutics. Similar observation made in a lady 50 years old; symptoms the same but less intense, but the sensation of dizziness also greatest when looking up. Eyes otherwise normal. Cured in the same manner. In a third case, a lady 51 years old, almost complete immobility of both eyes. Great photophobia, twitching motion upward when examined with the ophthalmoscope, followed by a deep swoon. No other cerebral disturbances found in any of the cases, but suspected. In one case of absolute immobility of both eyes, Panas found at the autopsy encephalo-meningitis of the cerebellum, especially in the region of the vermis inferior.

V. MITTELSTÄDT.

1201. BETTMAN, BÖRNE (Chicago). Examination of the eyes in two cases of fatal anæmia (from the path. inst. at the Univ. of Heidelberg). These ARCH., vol. xi, 1, p. 12. Anatomical investigation; numerous poikilocytes and microcytes in the blood; many punctate and ribbon-shaped hemorrhages in the retina with partly white centre, œdema of the layer of nerve fibres, and formation of varicose nerve fibres. No fatty degeneration or other pathological changes could be found in the capillaries of the retina (as also by Quincke, Litten, Uhthoff), while Manz and Eichhorst have detected aneurismal dilatation of the capillaries. The yellowish central spots are due to: 1. A collection of well-preserved lymphoid cells in the centre of the hemorrhages, which surround them without any sheath. 2. A retrogressive metamorphosis in these aggregations of cells, and to secondary changes in the tissues. 3. The occurrence of large nests of varicose nerve fibres in the hemorrhages. He calls into requisition the discovery of Rumpf, who found that the action of lymph upon the nerve fibres produces swelling of the latter, in order to explain the development of these varicosities.

1202. J. CORNILLON. Rapports de l'héméralopie et de l'ictère dans les hypertrophies du foie. *Progr. Méd.*, vol. xi, No. 9. In four cases hemeralopia was observed some time after icterus had set in in hypertrophy of the liver. A description of the ophthalmoscopic appearance, however, is wanting, so that it can only be surmised that there was retinitis pigmentosa, as in cases of Landolt; *Graefe's Arch.*, Bd. xviii, 1, p. 325.

MARCKWORT.

1203. DROSDOFF. Epidemic scurvy. *Journal of the Kasan Med. Soc.*, 1881, Nos. 14 and 15. From a report by Krückow. Among 200 scurvy patients, 28 with diseases of the eye. Besides hemorrhages beneath the conjunctiva and skin of the lids, 4 cases of keratitis serosa diffusa (one with a corneal ulcer), 2 cases of iritis, 4 of hemeralopia.

HIRSCHMANN.

1204. DUNIN. Case of pernicious progressive anæmia in a laborer 38 years old. *Gas. lek.*, 1881, Nos. 1 and 2.

HIRSCHMANN.

1205. GOWERS. Chorea with optic neuritis. Ophth. Soc. of the Unit. Kingd. *The Lancet*, No. 25.

1206. V. HIPPEL. Affections of the eye in recurrent fever. *Ber. über d. ophth. Klinik zu Giessen*, Stuttgart, Enke, 1881. Among 193 patients, 23 cases — 11%, were observed with affections of the eye, most of them irido-choroiditis. Hypopyon was never observed. In 4 cases the ocular affection set in during the attacks; in the others, 1–4 weeks later. In 2 cases hemorrhages of the retina were observed. Result favorable in all cases.

1207. HIRSCHBERG. Tuberculous inflammation of the eye. *Transact. of the Internat. Med. Congr.*, London, 1881, p. 117. Among 1,700 patients 3 cases, one of the conjunctiva bulbi, one of the iris, and one of the choroid. The diagnosis was confirmed in each case by the anatomical investigation. In 3 cases swelling of the lymphatic glands was observed as a secondary symptom, so that it is advisable to remove tuberculous deposits as rapidly as possible by operation. The changes in the eye are undoubtedly of a specific character.

1208. HUNNIUS, H. The symptomatology of affections of the pons, and the conjugate deviation of the eyes in cerebral diseases. Bonn, 1881. Cohn & Son. Compare.

(1208 a.) O. LEICHTENSTERN. The conjugate lateral deviation of the eyes in cerebral diseases. *Sitzungsber. des allg. ärztl. Ver. Cöln*, 23. Mai. *Deutsche med. Wochenschr.*, No. 44. Hunnius reports cases of his own, and after giving a résumé of the bibliography, he discusses the question whether the conjugate paralysis of the abducens and internal rectus is of diagnostic importance in diseases of the pons. Based upon his observation he modifies Prévost's conclusion by adding that in lesions of the cerebral lobes there may be insufficiency of the lateral motion, even when there is no conjugate lateral deviation of the eyes. The knowledge of the lesions of the corp. quadrig. is not sufficiently accurate yet in regard to the symptomatology of the paralyzes of the muscles following them, so that the position of the eyes is of little use in diagnosing diseases of those parts. In regard to lesions of the pons, Hunnius and Leichtenstern assert that when during unilateral convulsions head and eyes deviate to the other side, the diagnosis may be made that the cause of the irritation lies in the pons. There is, undoubtedly, a common centre of the abducens and oculo-motor nerves in the pons; it lies probably very near the abducens-nucleus.

1209. A. KEY. Case of retrobulbar glioma. *Hygiea*, Stockholm, 1881, No. 4, and *Nord. med. Arkiv*, vol. xi, No. 15, pp. 20 and 29. Treats of metastases of tumors of the eye in the cerebro-spinal system.

1210. LUCHHAU. Diseases of the eye and ear in recurrent fever. *Ver. für wissensch. Heilk. z. Königl. Berl. klin. Wochenschr.*, No. 43. Among 180 patients, 6 cases with diseases of the eye during the attack, in 3 iritis in one eye (once with hypopyon), in 2 optic neuritis of both eyes, and in one iritis in one eye with hypopyon during the first attack, from which recovery was complete, and during the second attack irido-cyclitis and neuro-retinitis in both eyes.

1211. MACHECK. The changes in the retina visible with the ophthalmoscope in rabbits poisoned with bacillus anthracis. *Kronika lek.*, 1881. Fine blood-vessels began to develop in the retina which thus far had been invisible, then general anæmia of the retina ensued, in consequence of embolism of the capillaries of the lungs.

1212. J. A. ORMEROD. The diagnostic symptoms of tabes dorsalis. *St. Bartholomew's Hospital Reports*, vol. xvii, 39, 1881. O. directs his attention in this interesting paper chiefly to the absence of the knee phenomenon and *affections of the pupils* in the early stages of tabes. He observes, in the first place, that (as is known) the true "Argyll Robertson pupil" (a small pupil with associated,

but with no reflex action) is subject to variations ; it may be larger, but act as above, or it may be motionless to associated as well as to reflex stimulus. In 8 cases with marked incoördination, reflex action of pupils lost or feeble, associated action normal in 6 ; both actions wanting or feeble in 2. In 4 with slight incoördination, reflex action lost, associated action normal 2 ; both feeble 1 ; variable 1. In 4 with other symptoms but no incoördination, reflex action lost or feeble, associated action normal in 3 ; both absent 1. In 21 cases optic atrophy in 4 ; 6 patients were more or less deaf, 2 of them having optic-nerve atrophy.

E. NETTLESHIP.

1213. J. HUGHLINGS-JACKSON. On tumors of the cerebellum. *Proceedings of the Medical Soc. of London*, vol. v, 50, 1881. The point of special ophthalmic interest is the author's statement that he has never seen defective V in cerebellar tumor without optic neuritis ; this in reference to the hypothesis that such tumor, especially if of the middle lobe, might cause blindness by pressing on corp. quadrigem.

E. NETTLESHIP.

1214. OSTERWALD (Prof. Leber's clinic). Another case of leucæmia with bilateral exophthalmus due to orbital tumors. *G. A. f. O.*, Bd. xxvii, 3, p. 203. In a child 4 years old exophthalmus and swelling of the lids had developed after an injury. In consequence of the former affection ulceration of the cornea set in. Tumors protruded beneath the skin of the upper lids, and a similar tumor lay embedded in the skin of the temporal region. The ophthalmoscopic condition of the right eye could not be exactly determined ; in the left there was slight choked disc. The amount of the exophthalmus was about 2.5 cm. The microscopic examination of the blood showed marked leucocythæmia. Cells replete with movable micrococci were found. The autopsy revealed tumors of the epicranium, of the transverse and cavernous sinuses, and on the external surface of the dura mater. Numerous hemorrhages in the retina and in all organs of the body. Choked disc in both eyes. Leucocythæmia of myelogene character. Numerous micrococci in the blood, spleen, and leucocythæmic tumors.

1215. RIEGER und v. FORSTER. Eye and spinal cord. *G. A. f. O.*, Bd. xxvii, 3, p. 109-202. The authors endeavor to prove, basing their assertions on their own clinical observations and experiments, that the ocular symptoms observed in diseases of the spinal cord, which manifest themselves as affections of the optic nerve, muscular paralysis, and the pupillary phenomenon, may be traced directly to an affection of the spinal cord. This direct connection is effected by the vaso-motor nerves, as the circulation in the fundus of the eye is regulated by the spinal cord, as they endeavor to show by experiments. In a similar manner Mooren has recently tried to explain the connection between affections of the eye and the uterus by means of the reflex theory ; *cfr.* No. 938. The authors then review the characteristic symptoms of the three groups mentioned above ; they consider it of importance for the differential diagnosis of the neuritic stage of the affection of the optic nerve, that the inflammation of the nerve reaches a higher degree when due to meningitis than when due to a spinal cause. In the latter case atrophic portions may almost always be found beside those which are in an inflamed condition. The functional examination shows more characteristic symptoms. Then they treat of the phenomenon of the reaction of the pupil for light and convergence, of the very variable

paralysis of the muscles, and finally of the connection of syphilis with this subject, in which they express themselves very favorably upon Erb's view. All investigations of other observers, however, are criticized adversely whenever they do not agree with their own theory. A very superficial criticism of a paper of the reviewer, contained in these ARCHIVES, vol x, p. 622 (German edition) is answered in *G. A. f. O.*, vol. xxviii.

1216. E. A. WOODS. Tuberculous tumor (?) of left optic thalamus. *Lancet*, Nov. 19, 1881, (ii, p. 867). Optic neuritis of right eye, with dilated pupils active to light and accommodation. Hyperæsthesia of part of right face; anæsthesia of lower part of right face and whole of right side. Absence of right knee reflex and of cremaster reflex. Athetoid condition of right hand, etc. Patient living. E. NETTLESHIP.

1217. ULLMANN. Un cas d'irite diabétique, *France Méd.*, No. 44, Oct. 13, 1881.

1218. ZAUFAL. Value of ophthalmoscopic examination for the diagnosis, prognosis, and therapeutics of diseases of the ear. *Prager med. Wochenschr.*, Bd. vi, No. 45, p. 448. When an inflammation of the middle ear spreads to the meninges, the eye of the same side is first attacked; generally, however, both eyes are affected. After trephining the mastoid process the hyperæmia of the corresponding eye vanishes more rapidly. Almost all cases of otitis media, with or without caries, which lead to meningitis and thrombosis of the sinus, are complicated with affections of the fundus of the eye.

MISCELLANEOUS NOTES.

The meeting of the German Ophthalmological Society will take place at Heidelberg Sept. 14-16 of this year.

The meeting of the American Ophthalmological Society will take place at the Fort William Henry Hotel, Lake George, N. Y., July 26th and 27th, preceded by the meeting of the American Otological Society at the same place.

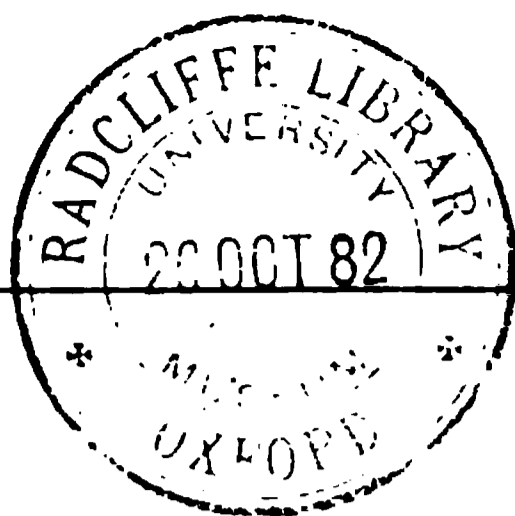
The National Eye and Ear Infirmary of Dublin—one of the oldest institutions of the kind in the United Kingdom, having been established in 1814—has been removed to its new premises in Molesworth Street. It has now twelve male and twelve female beds, and a private ward for a pay patient. The dispensary department has been extensively improved.

The Baltimore Charity Eye and Ear Dispensary, in charge of Dr. Samuel Theobald; the Eye and Ear Department of the Baltimore General Dispensary, in charge of Dr. S. L. Frank; the Eye and Ear Dispensary of the Church Home, in charge of Dr. Russell Murdoch; and the Baltimore Throat Dispensary, under the man-

agement of Drs. J. H. Hartman and Samuel Johnston, have been consolidated under the name of the Baltimore Eye, Ear, and Throat Charity Hospital. In the management of the new institution these gentlemen will be assisted by Dr. I. Bermann as ophthalmologist and aurist, Dr. John N. Mackenzie as laryngologist, and Dr. W. D. Boker as pathologist.

Dr. H. Knapp has been appointed professor of ophthalmology in the Medical Department of the University of the City of New York, in place of Prof. D. B. St. John Roosa, resigned.

The monument of the late Prof. A. von Graefe, in Berlin, was unveiled on his birthday—which would have been his fifty-fourth—May 22d. The oration (H. Peters, Berlin), delivered by his successor, Prof. C. Schweigger, describes in an admirable, concise manner Graefe's short but unprecedentedly brilliant career, and sketches the development of modern ophthalmology, of which Graefe, in conjunction with Helmholtz and Donders, was the chief representative.



ARCHIVES OF OPHTHALMOLOGY.

DISTURBANCES OF VISION AND UTERINE DISEASES.

BY DR. MOOREN, OF DÜSSELDORF.

Translated by WILLIAM C. AYRES, M.D., N. Y.

MANY women who suffer from eye diseases have an instinctive conviction that their eye trouble is in some way connected with the physiological processes of their menstruation. Before the introduction of the ophthalmoscope, the pathogenesis of such a relation was so little understood, that it is not to be wondered at that for a long time it was entirely discredited. It is the tendency of modern ophthalmology to seek a local cause for all disturbances of vision, and to use local treatment exclusively, but this has not met with the unqualified approbation of practising physicians.

It has always been insisted on, and in later literature again pointed out by Baumeister,¹ that there are "untold numbers of women who have disturbances of circulation from abnormal conditions of menstruation without any corresponding disturbances of vision." Of course this is an undeniable fact, but still it does not prove anything positive, since how many people have contracted severe colds without having had pneumonia or rheumatism; and how many workmen lie down to rest on the damp ground without contracting myelitis. We are not to ask the question, why does not the same cause always produce the same effect in the system? It would be much more important to

¹ *Klinische Wochenschrift*, No. 48, 1876.

know to what extent any local morbid process can affect the one or other part of the general system. Menstruation and its anomalies have been shown by innumerable observations to have the power of deleteriously affecting any part of the eye.

It happens not infrequently that, in a patient who has undergone a cataract operation, the eye which had had no previous anomaly becomes suddenly irritated, even two weeks after the operation, on the advent of menstruation. Such irritation sometimes causes a low degree of iritis. It should be especially remembered that such conditions occur even where the menstruation has been perfectly regular, since they show that disturbances of circulation, finding in the fresh wound a place of diminished resistance, are apt there to cause increased irritation, or even a new inflammatory process.

Such being the case under normal physiological conditions, pathological processes would certainly be rendered so much more potent when working under the same influence. I do not mean to say that the disturbances to circulation resulting from menstruation are always the *causa movens* of eye disease, but that they may be an aggravating factor in an eye trouble which depends upon a condition with which the function of menstruation has not the least connection.

Some years ago a young lady consulted me on account of an interstitial keratitis of both eyes. It had increased so much at her time of puberty that she was obliged to keep her eyes closed for days on account of pain and photophobia. Between her periods they were better, so that she was able to open the lids for half an hour toward the evening of each day. Since her childhood she had always been under the care of a doctor. Before her puberty the inflammation sometimes subsided for weeks at a time, but at this turning-point of her life, instead of getting better it got very much worse. My diagnosis was that she had congenital syphilis (from her father), or that she had contracted it from vaccination. Notwithstanding the anæmic condition of the patient, and her scanty menstruation (regular), she was im-

mediately put under a systematic treatment by inunctions. She was also treated internally with ferrum citr., and, besides, before each period she was ordered one half teaspoonful of elixir propr. Paracelsi twice daily. Her eyes were treated with cataplasms for one hour every evening. As the vascularization of the cornea was done away with by this treatment, eserine was dropped into the eye to clear up the opacities. After three months she was perfectly cured. As an after-treatment she was ordered to take a tablespoonful of iron and cod-liver oil every day throughout the winter, with small intermissions. Since then she has had no inflammation not even at the time of her periods.

A very large number of observers agree, that in inflammation of the external tunics of the eye, conjunctiva and lids, there are exacerbations simultaneous with the occurrence of menstruation. Why it is that this occurs in some cases and not in others, we cannot explain. It is, however, a fact, which no ophthalmologist, who has any claims to be called a circumspect therapist, can fail to appreciate. If a physiological fluxion which lasts such a short time can have such an influence, a pathological condition of menstruation must have an infinitely greater one, and, indeed, we find it so. Nothing could be more suggestive than the fact, that in young girls who have chronic trachoma, we sometimes see at the time of their molimina menstrualia a new crop of trachomatous granules spring up, even if the menstruation is irregular or very scant. I distinctly remember the case of a girl of 14 years who had an intense keratitis pannosa, and, notwithstanding the fact that every symptom of her molimina menstrualia was present, she could not be brought to menstruate, but, nevertheless, had such an inflammation every four weeks, that a whole year's treatment had not the slightest effect. When her menstruation did occur every thing was changed, but the tissue of the cornea of the right eye was so transformed, that the cornea, although transparent, remained a very irregular cone.

To show the enormous importance of this physiological hemorrhage I will relate the case of a strong country

woman who consulted me in 1857. She was 28 years old at that time, and had never menstruated on account of an arrest of development of her uterus. Every month her face became very hot and swollen. She had had interstitial keratitis in both eyes since her 15th year, which had withstood all treatment, and which was much worse every four weeks, remaining so for several days. By the use of strong emmenagogues and Friedrichshaller bitter-water, she had a very insignificant menstruation a few times in succession. It was astonishing to notice the effect; she was freed of her pain and photophobia as if by magic. This condition lasted only 12-14 weeks: notwithstanding every conceivable medication her menses did not return, and the eyes relapsed into the same condition in which they had been for 13 years.

Diseases of the sclera are always more prevalent in females, and even though the etiology of episcleritis is very obscure, from the fact that it happens so frequently in women, we may draw the conclusion, that it stands in some relation to diseases of the uterus. One thing is certain, viz., that the occurrence of a menstrual disturbance prolongs the course of an episcleritis, and even induces a complication of iritis. I have seen a case in which I was forced to consider that a metritis and a change in the position of the uterus brought on an attack of episcleritis. The patient was 45 years old. Her right eye became affected at the time she was undergoing a treatment for retroflexion of her uterus, in which there was a tumor of its neck. Every time that the vaginal portion was touched, or a pessary was fresh put in, her episcleritis was worse, and she had intense ciliary neuralgia. The episcleritis was cured, and remained so for about a year, when she again had uterine trouble, and episcleritis occurred in her left eye, which got very much worse every time there was a local application to her uterus.

It is quite a widespread opinion that anomalies of menstruation have a deleterious effect upon some portion of the uveal tract. Without expressing any opinion as to whether this is the case or not, I would remark

that iritis occurs very much oftener in men than in women, because it is in the majority of cases the result of some external circumstance, as colds, traumata, etc. Inflammation of the iris as the result of menstrual disturbances is comparatively rare; it is more frequent in anæmic individuals when the menses have been stopped by exposure to cold. Menstrual disturbances are much more potent when synechiæ have already taken place from pure iritis, or iritis which has resulted from choroiditis; and even in such cases we seldom observe any direct increase in the inflammation, but rather such complications as hemorrhages into the anterior chamber, and still more frequently temporary obscurations in the field of vision during the menstrual period. * * * According to my own experience I would say that of all the eye affections, of choroid, retina, optic nerve, etc., there are none which are not influenced either by the normal or pathological workings of the uterus.

Dr. Ludowigs has taken the pains to prepare statistics from

No.	NAME OF DISEASE.	MEN.		WOMEN.	
		I	II	I	II
1	Morbus Basedowii	—	—	—	2
2	Episcleritis	2	—	8	1
3	Keratitis interstitialis	8	8	12	16
4	“ profunda	2	3	11	9
5	“ punctata c. iritide serosa	—	—	6	1
6	Iritis	12	—	16	1
7	Irido-choroiditis	10	9	12	22
8	Choroiditis latens	3	3	3	4
9	“ glaucomatosa	3	1	1	—
10	“ dissem., areolaris, atroph.	6	1	5	4
11	Myodesopsia	—	8	8	13
12	Obscuratio corporis vitrei	4	—	9	3
13	Hyperæsthesia retinae	1	4	—	10
14	Hyperæmia ret. vel nervi optic. e. menstruatione irreg. vel hyperæmia meningiali	1	5	5	31
15	Apoplexia capillaris retinae et choroideae	8	—	11	1
16	Solutio retinae	33	3	18	2
17	Amblyopia e metrorrhagia	—	—	2	3
18	Neuritis optica et neuroretinitis	5	7	6	23
19	Asthenopia ex anæmia	—	5	—	40
20	Insuff. m. recti int. ex anæmia	7	—	17	—
	Total	162		336	

the various cases of my clinic, in order to find out what kind of cases could be attributed to uterine trouble. Among 5,507 new patients, who presented themselves from January 1st to December 31, 1880, there were 2,907 men and 2,600 women ; children and adults together. All cases in which lues or traumata had been present were not counted. In the foregoing table will be found those cases of spontaneous eye troubles from the beginning of puberty, tabulated as to whether they were one-sided or bilateral.

A comparison of this table shows that such affections happened in 162 men and 336 women, or 32½% men and 67½% women. Even if we do not wish to enter more fully into the etiological details, the table shows beyond doubt that there is a predisposition on the part of women to such diseases.

According to the combined evidence of the whole medical world, the majority of physiological and pathological phenomena in women depend upon the functions of the uterine system. It is also a fact that the irritation of any sensitive nerve not only acts in a reflex manner on other nerves of the same or different energy, but causes a determination of blood to, or the emptying of, certain vascular systems to which the irritated nerve has no relation. This is true to such a degree that no physiologist can say *a priori* to what an extent a primary irritation will go. It may therefore happen that even an irritation or inflammation of the mucous membrane of the vagina may have an influence in producing a retinal hyperæsthesia or an accommodative asthenopia. If I may so express myself, not only the intensity of the local affection, but also an individual predisposition certainly have a great influence in bringing about such secondary pathological disturbances. We may put it down as a general rule, that genital affections and general morbid processes have an influence on the condition of the eyes, and so much more if they find them already inflamed. Again, if the simple introduction of a speculum can cause a visual disturbance, as has been often observed, it would be but natural to suppose that masturbation, which is analogous to it, should have very decided influence in bringing about

serious eye trouble. As an illustration, I may cite the case of Miss N., 24 years old, who confided to me, with a great profusion of tears, that she had practised Onanism since she was 15 years old. Her loss of power of accommodation and photophobia had increased from year to year in such a manner as to have caused her great alarm. Her labia minora hung out like elongated cords. The clitoris was unusually large, and was so excitable, and could bring about such a dyspnœa, that I was obliged to advise her to have it amputated. In the case of a South-American lady who had been the slave of the vice since her early youth, there was an excessive hyperæsthesia, and her accommodation was paralyzed to such an extent that she had to use convex 6 to see near by. In addition to this there was an occasional sensibility of the ciliary body; she thought that objects receded from her, and were therefore much smaller than normal. The subjective complications which resulted from her condition were varying; sometimes she suffered from dyspnœa, at others she was anæmic and lost all power of accommodating for near objects, as if she had insufficiency of the internal recti muscles. I have never seen a visual disturbance resulting from an acute vulvitis, nor from abscesses in the glands of Bartholini, but my experience in such conditions has been very small. I have seen such disturbances of vision as above described in cases of acne pustules which extended from the outer genital organs to the mucous membrane. I remember such a case in an unmarried woman of 30, in whom there was such itching that she had to get out of bed 4-5 times every night; in her case there was no other complication except a few psoriasis patches on the neck, fingers, and in the axilla. These I attributed to a constitutional syphilis of her remoter ancestors. The acne pustules and the constant scratching had produced such an inflammation of the mucosa that she could not stand a single soothing injection. After a continued use of morphia suppositories and warm water, she could tolerate weak solutions of carbolic acid, which, in connection with Fowler's solution of arsenic, made her life again bearable. We meet the same disturbances in pure pruritus

vaginæ, a disease which we may call a neurosis of the nervus pudendus, and consequently capable *a priori* of causing a retinal hyperæsthesia. I think also that vaginismus can also bring about the same condition. I have also seen visual as well as general disturbances produced by these excessively sensitive papillary swellings, which occur at the mouth of the urethra.

I know a Frenchwoman, slightly hyperopic, whose head was so sensitive that she could not wear spectacles. She could not use her eyes for any length of time, notwithstanding the fact that her sight was good. The ciliary body was nowhere sensitive, but the hyperæsthesia of the retina was so great that she could hardly enter an illuminated room. After having cauterized her angioma polyposum with cupr. sulph., and giving her pills of bromide of potassium and lupulin for several months, she was able to wear her glasses. I have found in my experience of 23 years that sometimes when a woman cannot wear her glasses, there is often a uterine complication.

These facts are sufficient to show how easily a relatively slight uterine disease can bring about a whole concourse of eye troubles. Indeed the patient is lucky if her eyes are not affected to a greater degree than was the case in those already mentioned, since there are infinitely more people in whom the reflex irritation brings about more important changes in the background of the eye.

The wife of a friend of mine suffered from a few very prominent glands of Naboth, and consulted me on account of a central choroidal exudation in her left eye, while in her right the sight was reduced to $\frac{1}{8}$, on account of sclero-chor. post. A few years after marriage she was put under the care of a prominent gynecologist, and on account of a small operation, and the introduction of a speculum, she suffered such pain in her back and legs, and finally obscuration of sight, that she lost confidence in him. She was dismissed from treatment, but advised to use quite a strong solution of warm salt water. After the first injection she could hardly move her legs; from the hip to the feet they were ice-cold, both subjectively and objectively, whereas the upper part of

the body was very hot. Simultaneously with this disturbance of circulation, she was often absolutely blind, for a few minutes at a time. Since the injections were continued, she had sensations as if the heart stood still, and again the sight was reduced: and a large detachment of the retina resulted. I did not see her until a few months after this had happened, when, on account of a perfect transparency of the vitreous, and a normally reacting pupil, I made up my mind to puncture the retina, if I could not do away with the source of irritation in the ovarian nerves. For this she was ordered: Kal. bromat., 4.0; lupulini, 6.5; pulv. rad. rhei, 1.5; extr. cent. min. q. s. to make 120 pills; 3 to be taken three times daily. At the same time the feet were covered with Priessnitz's bandages, in order to force the blood into the extremities by heat. On account of the heat in her head ice-bags were applied to the temples. This was continued for six weeks without any result, except a profuse uterine hemorrhage. I did not see her afterward, and was therefore not able to determine whether the hemorrhage was caused by an ovarian irritation or not.

I remember the case of a lady 26 years old, who said although she saw well she could not do her housework for ten minutes at a time. Formerly she had seen well in the distance, then she became near-sighted. She was treated with atropine; a hyperæsthesia of the retina intervened, which prevented her from mixing at all in society. She said that her symptoms commenced immediately after marriage; and that every cohabitation was excessively painful. Examination showed that there was a hard exudative mass in the right parametrium, which was attached to the body of the uterus posteriorly, and extended like a fan along the ligamentum latum. She was ordered a lukewarm injection twice daily, and in the evening an iodoform cotton tampon. She was also given bromide of potash for four weeks to do away with the reflex irritation. She had no local treatment except atropine twice daily, and after five weeks she was able to go about her usual work, but the myopia remained at $\frac{1}{18}$.

I saw her again in the winter, when the exudation was

much reduced in size, and was but little sensitive to the finger. Her general condition was very much improved. She was ordered iodide of potassium for the absorption of the exudation.

From a clinical standpoint, her symptoms were brought about by a reflex irritation from a parametric patch, which was much lessened by the treatment employed. I do not think that the condition of the eyes can be benefited when such an exudation has subsided into cicatricial tissue in the parametrium. Compare this condition with the *kopiopia hysterica* described by Förster and Freund.

I also remember the case of a lady 75 years old, who could not bear artificial illumination, which trouble she says commenced at her time of puberty; for 57 years she had always retired to a dark corner as soon as the lights in the house were lit. As in all such cases the sight was good, indeed I have never heard of a case in which the sight was materially reduced. According to Freund, the inflammation of the parametrium passes off and leaves a cicatricial condition, and produces irritation along the broad ligaments to the walls of the pelvis, the cellular tissue of the rectum, the bladder, etc., and the nerves connected with these parts. In the same way as a parametric exudation or its results produces such irritation, so can a similar condition of any of the soft parts around the uterus. I know of a lady who had during her first delivery suffered a rupture of the perineum, followed by considerable sinking of the womb. She had four children, and with each delivery the defect was increased. When I examined her, her sight, field of vision, and color-perception were normal, but there was such a spasm of accommodation, and hyperæsthesia of the retina, that she could attend to none of her domestic duties. There was a slight improvement from atropine, but I was obliged to tell her that no medication would cure her unless she had the perineum operated on.

All conditions which tend to narrow the orifice of the uterus can have the same results; therefore we see hyperæsthesia of the retina in cases of dysmenorrhœa. As an illustration, I know of a young lady, 21 years old, in whom

the uterus was as small as an infant's, and she suffered from the most pronounced retinal hyperæsthesia. This form is most often met with in congenital stenosis of the orifice, when the small opening empties into a contracted vagina. It is seldom in this condition that we do not find increased retinal hyperæsthesia at the time of the scanty menstruation. I have seen such cases, and also the same condition, in two cases of tumor of the uterine walls, and again in uterine displacements.

To put the whole thing in a few words, we can say that any inflammatory process in any part of the genital tract, causing alterations of its shape or dimensions, can produce a hyperæsthesia of the retina; this being once produced may bring about a variety of other conditions. In the lower degrees of hyperæsthesia the patient complains most of myodesopia, whereas in the higher ones they have subjective flashes of light and troublesome after-images. When the condition lasts a long time a narrowing of the field of vision is almost a constant symptom, even where there is no material diminution of sight. Then, again, the central vision can suffer very much, while there will be but little narrowing of the visual field. Again, the whole thing may result in a torpor retinæ. Stephan has shown that these two conditions are stages of the same disease. I once treated a girl of 17 who had stuck a pen in her little finger, and a very decided retinal hyperæsthesia manifested itself. She then had tetanus, and after she recovered it was changed into pronounced anæsthesia optica. Under proper treatment the whole condition disappeared. In this case, during the first stage, the central vision was much improved by wearing a dark blue glass, whereas in the latter stage such a glass reduced her sight very much.

It seems also that such reflex retinal irritations can bring about disturbances of circulation in the optic nerve, retina, or even the brain, since it can hardly be called an accident that in such conditions we often observe a hyperæmia of the papilla, or that a patient should complain of constant headache. It is of no moment whether the hyperæmia is an active one, or whether it is brought about by relaxation of

the vascular walls, as in some cases of metrorrhagia. In the latter case we sometimes find hemeralopia superadded on account of the condition of the retina.

Landolt assumes four conditions of visual disturbance in cases of ovarian irritation described by Charcot.

I.—The eyes show no objective symptoms, neither externally nor ophthalmoscopically. The two eyes differ, however, on functional examination. On the well side vision is normal, but there is a narrowing, and especially of the color field. The eye on the diseased side shows a diminution in all the retinal functions to an equal degree.

II.—There is a second condition or stage in which the objective symptoms are more pronounced on the diseased side, when they commence to appear also on the well side.

III.—In those cases where the retinal functions are very much reduced, viz., where fingers can hardly be counted, and the field of vision is reduced to within a few degrees of the point of fixation, the ophthalmoscope shows a distention of the retinal vessels with a serous transudation.

IV.—Once he found a partial atrophy of the optic nerve of both eyes in addition to the foregoing symptoms. I have often seen a commencing atrophy after a long-standing retinal hyperæsthesia. It is not even very rare that we see a detachment on one side brought about by a congestion of the head, from ovarian reflex irritation of the vagus. Last winter I had a patient who presented the whole complex of symptoms from this condition, as follows: She was unmarried, and her menses were always scanty; they sometimes lasted less than two days, and were always very painful. Her general condition was good. In the right eye she had anæsthesia of the retina, with a rosy injection around the papilla. She could only read Jæger No. 3, and her field was concentrically limited to four and a half inches. She had lost her sight in the left eye a number of years ago; it showed advanced atrophy of the nerve and a partial detachment of the retina. Centrally she could still count fingers at 2–3 feet; she did not recognize red or green. After a long treatment the sight of the right eye was restored.

We frequently meet with mydriasis, sometimes single,

sometimes double-sided. In the case of an excessive hyperæsthesia with scanty menstruation in my practice, it was bilateral. There was also great tenderness near the 2d and 3d dorsal vertebræ: the ophthalmoscope showed nothing. After five months the pupils returned to their natural size. In another case the same symptoms were induced by an epithelial exfoliation in the vagina; there was great hyperæsthesia and hyperæmia of the retina, with great reduction of sight; it lasted almost a year. She had a relapse, but her vision was not so much reduced as before, but the condition remained the same for four months. A third case was the fault of endometritis, a fourth of parametritis. In both of these the mydriasis was one-sided; the former of these was cured, the latter not. A fifth case came from retroflexion and had hyperæsthesia retinæ on both sides, with great contraction of the visual field; mydriasis only in the right eye.

I have observed only one case of myosis; it was in a woman 68 years old, who had prolapsus uteri; the condition had existed for years without any paralysis of the legs or bladder. There was a very slight atrophy of the optic nerve. With convex 11 she could read the finest type. I can only explain the myosis by considering that there was a paralysis of the sympathetic nerve.

Heretofore we have only considered the effects of the chronic diseases of the uterus. The acute ones are sometimes even more dangerous to the eye, since they not only act mechanically, but are also accompanied by high fevers. I have seen even a pneumonia or a pleurisy with a lasting fever of 39.5° cause retinitis, choroiditis, and fine opacities in the vitreous. How much more dangerous would we expect an acute parametritis to be, since, independent from the very high fever which accompanies it, the locality of the disease is in the immediate vicinity of the ovaries, where an irritation may cause all kinds of circulatory disturbances. I have seen grave results of such cases in my practice, resulting in detachment of the retina, etc.

Capillary hemorrhages resulting from neuro-retinitis are not important in themselves, simply expressing some im-

pediment in the retinal circulation. They are much more astonishing when they occur spontaneously from some pathological process in the internal genital organs. In this case they represent an increased blood pressure, caused by reflex irritation of the vagus from exudations or anomalies of position of the parts in subperitoneal cavity. I have seen such hemorrhages resulting from a prolapsus uteri.

The cause and pathogenesis of a certain kind of retinal apoplexy which we see in German factory women is, again, the expression of an eye complication in pernicious fever. I have never seen a case of this kind which could be traced to a uterine disease, and it seems to me that this form is a special result of a general disturbance. In this disease there is a peculiar blank expression of the face; respiration and the heart action seem to be carried on with difficulty. In such condition retinal hemorrhages occur in the majority of cases in both eyes, and are arranged in streaks along the larger vessels. In some instances we see small extravasations, but generally there are large irregular plaques. The danger to sight increases according to their proximity to the macula lutea. If they do not cause primary destructions of tissue they may be absorbed, and the function of the retina perfectly restored at the seat of extravasation. However, there are always certain pigment masses left, but besides these pigmented spots the retina always clears up.

I have observed 10-12 cases of this form in which there was a horizontal defect in the field of vision, generally below, which went almost to the point of fixation, but in no case implicated it. The retina had not suffered any material change, and we are therefore forced to conclude that the disturbance was caused by a small hemorrhage in the intravaginal portion of the optic nerve, which caused a temporary compression. This form of hemorrhage can not be said to be restricted to females, but at the same time it happens very seldom in men, probably not in more than one in six cases. I do not remember a single case in which all the symptoms did not rapidly disappear. It was double-sided in only two cases. A sector-like defect is much more

serious, since I have seen no case in which it was completely cured. It frequently happens on one side as the result of some disturbance of circulation coming from the uterus, but when it is bilateral it is more probably the result of softening of the brain, in which it is not unfrequently connected with Bright's disease of the kidney.

It must be conceded that the sudden cessation of the physiological functions of the uterus causes a venous hyperæmia, which on its part will bring about a stagnation of blood in remoter localities. In the same way, all such conditions as parametritic exudation, retroflexion, anteflexion, descensus, prolapsus, tumors, etc., must have an analogous effect upon the pelvic organs. In the upper part of the ligamentum latum we find the plexus pampiniformis, formed from the veins of the ovaries and the tubes, and also the uterine plexus, standing in the closest relation with the lumbar veins. These again connect with the spinal veins and those of the spinal cord, so that the one can bring about great circulatory disturbances in the others. The simplicity of the anatomical structure of the venous canals renders this so much the more easy. It is also an anatomical fact that the veins of the vertebral column are strongly developed, and communicate above with the occipital veins, which through the mastoid foramen communicate with the transverse sinus. A congestion of these veins must also cause pressure on all the nerve elements in their vicinity. In this way it will be seen that they bring about all those sensations of pain, burning, heat, or cold in the back, etc. Physiology teaches us that such abnormalities of sensation as are combined with visual disturbances, are the result of irritation of the posterior roots and cords. Pains in the back of the head and in the branches of the trigeminus are produced by a direct implication of the fibres of the cervical plexus, and by an irritation of the cervical roots of the trigeminus (Erb).

We must thoroughly understand these anatomical facts before we can appreciate how a venous congestion working on the occipital lobes can bring about a "fulminating attack of blindness" after a sudden cessation of the menses. According to Ferrier the visual centres are situated in the

so-called gyrus angularis. On account of the decussation a destruction of one gyrus would cause blindness in the opposite eye, and a destruction of both, blindness in both eyes. The cases of Pooley, Hirschberg, Huguenin, and Rosenthal are further evidence of the fact that in man the visual centres are situated in the occipital cortex, fibres of which pass through the corpora quad., geniculata, and optic thal. to the optic tract, and partially decussate at the chiasm. A rapid compression of these parts is sufficient to bring on a transitory blindness without any complication in the background of the eye. Samelson's case is a good illustration; a young woman of 21 had to work standing with bare feet in water at the time of her menses. The sudden menostasis caused a disagreeable sensation of pressure behind the eyes the same evening. Within a month she was completely blind. The ophthalmoscope showed nothing but a strong retinal reflex and a slight engorgement of the veins. In another week her sight returned. Samelson thinks there was a transudation in the orbit which compressed the optic nerve. Baumeister suggested, however, that this was not probable, because the mobility of the eye was not interfered with, and there was no exophthalmus. I agree, however, with Samelson in assuming that the process could only have been the result of a compression on the occipital lobes, caused by venous stasis. This view would also account for the orbital pain through excitation at the origin of the trigeminus. I have seen other such cases where there was terrible pain in some of the branches of the trigeminus. In one instance there was great pain in the ramus nasalis; in others, excessive secretion of saliva.

I remember, again, where a suppression of the menses did not interfere with sight, but affected the facial and abducens of the left, and the rectus internus nerve of the right eye. My diagnosis was a blood-extravasation in the posterior wall of the pons between the corpus olivare and restiforme on the right side. Such forms of amaurosis are, however, very rare: the blindness is either accompanied or soon followed by retinal transudation, but so long as it is the result of a rapid venous stasis and without paralysis of the sphincter,

pupillæ, we may hope for a speedy cure. As an example of how the optic nerve may recover, I will relate the case of a woman of 20, who had hemorrhoids in consequence of a disturbance of circulation produced by descensus uteri. She had retinal transudations 5-6 times; sometimes in one eye, sometimes in the other. At times she could only count fingers at 1', and F was 10° perimetrically. She recovered her sight after every attack. I have often seen, however, that the neglect of such conditions has led to permanent changes in the retina.

Too much stress can not be placed on the venous character of the pathological process, since it is an essential element of prognosis, being entirely different from the class of diseases which are brought about by arterial hyperæmia. If we wish to express the whole thing in a few words we may say that the brain has become tired. Without saying that this happens only in girls who have been too severely worked at school, I would remark that, of all countries of the world, in Germany girls at the age of puberty are taxed the most at school. This is of itself a bad condition of affairs, but when it is connected with the trying of this particular age, it is much worse. I have often seen young ladies complaining of difficulties in vision without any change in the background of the eye, their condition having been looked upon by their parents or their family physician as simple asthenopia. Eserine would do away with the symptoms for $\frac{1}{2}$ - $\frac{3}{4}$ of an hour, but after this they would come back. In the same way atropine would give great comfort, but only for a short time. In good illumination S is almost normal, but in subdued light $S = \frac{1}{2}$ - $\frac{3}{4}$. F is complete. If the condition lasts a long time we find a slight hyperæmia of the papillæ, but this is often enough at the boundary of the normal. All the symptoms increase if the brain is much taxed, and, in fact, it can go as far as nausea and intense headache in the back of the head. Sometimes the patients are sleepless, sometimes they sleep involuntarily after eating, etc. In fact, all of their symptoms seem to point to a meningeal hyperæmia. As long as this is active, there are symptoms such as headache and excitability, but when it becomes passive the patient is apathetic.

We frequently see old women who have become gradually blind from atrophy of the optic nerve without having had any acute symptoms. The statistics of Lang (Hirschberg's clinic) and the observations of Rokitansky and Förster show that a continued hyperæmia of the brain leads to an exudation of crude gelatinous connective tissue, which when cicatrizing causes a destruction of nervous tissue in the brain and spinal cord. Rokitansky has demonstrated the same condition in the olfactory and optic nerves, in the spinal nerves, etc.

We can say that females are peculiarly predisposed to such conditions on account of their inability to stand much mental strain, their menstruation, and on account of the innumerable disturbances to circulation which diseases of the uterus induce. I have seen several such cases in my practice.

There is another type where disturbances of vision result from myelitic processes. Twelve years ago, a young lady consulted me on account of a neuritis optica duplex. She was lame on account of a retroflexion of her uterus, and the extremities of both legs were anæsthetic. The uterus was put into proper place by a pessary. From that moment her neuritis improved. Her good condition continued for several years, when she began to experience severe headache on one side of her head, and had double-sided mydriasis, when she was found to have another retroflexion with inflammatory symptoms. Since I have taken this case as a type, I would remark that a connection between diseases of the uterus, bladder, kidneys, and intestines and those of the spinal column has been made by older observers. The paraplegia makes it probable that myelitis had been developed. In order to explain the pathogenesis of such a condition, I would refer to Tiesler's experiments, where cauterization of the nervus ischiadicus caused symptoms of inflammation of the spinal cord, with consecutive paraplegia and incontinence of urine, without any inflammation of that part of the ischiadicus situated between its origin and the place of cauterization. Klemm's observation is much more important where he observed a spreading of the primary in-

flammation to the spinal cord. Also the most important fact, that the inflammation went into the cranial cavity, and could even pass from a certain nerve trunk to the corresponding nerve on the other side. According to Rumpf, where the vascularization of symmetrical portions of the body is in intimate relation, a change in sensibility is always the result of a variation in hyperæmia and anæmia of the surface of the skin. He also shows that even artificial hyperæmia of one side produces anæmia of the other.

That there is a myelitic process in the optic nerve under such circumstances, is not to be doubted, whether it occurs as an independent disease or as a secondary complication from the urino-genital or uterine system. In diseases of the uterus the plexus uteri and the nervi sacrales are the means by which the spinal cord becomes affected. It can first be a local affection in the spine, and afterward complicate the optic nerve directly or indirectly, through the general system. Again, the opticus may be complicated without the least appearance of inflammation in the spinal cord. Whether the optic neuritis is developed as above described, or by venous stasis, the anatomical damage does not result from the inflammation alone, but still more from the effect which the lymph congestion has on the axis-cylinders of the nerve fibres. Rumpf, who discovered this process, has shown that an absorption of the axis-cylinders can thus take place. The first to show such a result in the optic nerve was Kuhnt.

As Cohnheim has demonstrated, the lymph vessels serve as a means to carry off all transudation from the blood-vessels. The greater the venous stasis the more important the lymph passages become, and at the same time the less they are able to carry off transudations, so that œdema is the result. Thus it happens that every optic neuritis can develop into a true neuro-retinitis by an extension of the accompanying œdema. The acute forms of neuro-retinitis which we see so often after excessive hemorrhages in abortion, placenta prævia, ovarian tumors, etc., are almost always characterized by the bad effect they have on the sight. We must not forget that a loss of blood causes a diminished heart action, which in a weak constitution may cause much

damage in the optic nerve and retina. Thus primary retinal anæmia will cause serious transudations in the neighboring tissue as an anatomical necessity.

The destructive influence of transudations on the axis-cylinders is thus rendered very great, and the retina and optic nerve soon show it in consecutive atrophy. There is another kind of neuro-retinitis, setting in as an acute affection, but running, as it were, a latent course, ordinarily termed atrophy after hæmatemesis. It differs in its local symptoms at the papilla from ordinary neuro-retinitis, but its nature is the same. The sudden loss of blood is the essential cause, the *ulcus ventriculi* is accidental, as it occurs just as frequently after abortion and metrorrhagia. The emptying of the blood-vessels destroys the function of the retina so rapidly that blindness comes on either at the time of the hemorrhage or immediately after it. A few hours later, there is a slight serous transudation at the papilla, and occasionally small hemorrhages in the region of the clouded zone. This agrees with the fact that a few hours after an excessive loss of blood, we find a collateral œdema and also extravasation of red blood corpuscles. The transudation disappears in a few days, and if there is no blood to be seen, no vestige is left to point to the pathogenesis of the affection. It appears also that an interruption of circulation during a few days is quite long enough to render the retinal arteries impervious forever, otherwise we could not understand why such a process causes permanent blindness. In some cases the blindness is not sudden, but the nerve atrophies slowly. The quantity of the loss of blood, and more or less personal power of resistance, determine the extent of the damage to the eye. All extensive hemorrhages have an effect on the sight, sometimes only in the shape of accommodative or muscular asthenopia, sometimes in contraction of the range of accommodation; again, in diminution of vision, either transitory or permanent. They may also cause hemeralopia. With the ophthalmoscope we sometimes see an enlargement, sometimes a contraction of the retinal vessels. In fact we meet with all kinds of changes, from a simple transitory impairment of vision to a progressive atrophy of the optic

nerve. A constant fact is that a previous myopia always advances by the anæmia.

Of the same character are the disturbances which cause transient retinal transudations with rapidly disappearing amaurosis during pregnancy or shortly after delivery when the circulatory impediments lead to albuminuria.

If the loss of albumen from excessive hemorrhage has passed beyond a certain limit in reducing the vitality of the organism, the amblyopia may withstand all medication, the substance of the optic nerve waste away, and amaurosis be the ultimate result. I have seen the nerve atrophy to continue even when the primary cause was removed. Such an issue is particularly to be expected in weak constitutions, in which the action of the heart has been enfeebled by physical, moral, or social troubles. Anæmia of the brain with disturbance of sight may occur without hemorrhage in all conditions which cause great irritation of the contents of the abdominal cavity.

According to Litten, in a case of carcinoma uteri, the arteries and veins of the retina were not to be distinguished from one another, both being exceedingly small. The usual symptoms of neuro-retinitis, or pallor of the disc, etc., frequently accompanying general amblyopia, were absent. The changes in the background of the eye are, as a rule, not in proportion to the extent of the uterine complication, but to the extent of the anæmia. As evidence of this, Litten cites a case of total degeneration of the uterus with no change in the eye, whereas in another, where only the neck of the uterus was diseased, ocular changes were present.

It is remarkable that all the alterations in the optic nerve and retina from excessive hemorrhage are not accompanied by opacities in the vitreous. When these are present, we always find as their causes retinal hemorrhages, or disturbances of circulation in the uveal tract. They exercise an obnoxious influence on the nourishment of the lens system, favoring the development of cataract. I have published my experience on this point, stating that the formation of a nucleus was but little marked, the lens substance was semi-soft, and had a bluish-white tinge. The occurrence is so

constant that I consider such conditions as an indication of marasmus. It makes its appearance in the middle age of life after excessive metrorrhagia, or after many confinements. It occurs also in young women who during the period of lactation are affected with a transudation into the vitreous, followed by opacity of the lens, beginning at the posterior pole. Since the above publication, my further experience warrants me in saying with more emphasis, that a loss of albumen leads to a hydræmic condition which not only brings on cataract, but also has an influence on its consistency. It is an old observation to find an issue of fluid vitreous in extracting such cataracts, and these eyes require the greatest care during the after-treatment, lest a supervening choroiditis do away with the good result of the operation.

Choroiditis disseminata occurs frequently in females whose menstruation is scant ; this, however, is not the cause of the eye trouble, for we see the choroiditis in girls not old enough to menstruate. Their cachectic and anæmic condition, and their menstrual anomaly have a common cause—ancestral syphilis or scrofula. I believe that the maceration of the choroidal pigment results from a congenitally diseased lymph. There are cases, however, in which the eye trouble can only be referred to irregular or suppressed menstruation.

Chronic choroiditis with fine opacities in the vitreous is often connected with anomalies of menstruation about the times of puberty and change of life, yet not so frequently as to indicate a definite causal relation, as it is brought on oftener, perhaps, by injurious external and constitutional conditions. The tendency which the inflammations of the choroid show to extend to the iris has long been known, but I wish again to remark that the appearance of the menses almost never shows an exacerbation of the choroiditis. It commonly causes nothing worse than slight temporary obscurations of the field of vision, or small extravasations of blood into the anterior chamber.

Precipitations on the posterior surface of the cornea (*kera-
titis punctata*), which we see so frequently in serous iritis

and irido-choroiditis, depend, I think, in the majority of cases, upon menstrual anomalies or direct genital irritation. I have met with a number of such cases.

Chronic choroiditis frequently occurs in women at the climacterium or shortly after that period, as also in all those conditions of the uterus which result in a hyperplasia of its walls. They are included under the general term of chronic metritis. In this condition the uterus is enlarged, and becomes sensitive to the touch; the vaginal portion is sometimes enlarged, sometimes diminished in size, hard in some cases, soft in others, etc. All these conditions cause disturbances of circulation, and have a great influence on the eyes. These morbid uterine processes are very slow, and their consequences last a long time, so that it is not astonishing that just in this kind of choroiditis we notice the occurrence of glaucoma. For many years I have been aware of this pathogenesis, and stated¹ that notwithstanding the hardness of the globe the excavation was not marked. The background of the eye, especially around the papilla, is dull, red, and blurred; the vitreous is diffusely turbid from fine opacities; and the sight greatly reduced, with an extensive peripheric limitation of the field of vision. In such conditions the sooner iridectomy is done the better are its results. I was alone in this opinion for a long time, but lately many authors have come to the same conclusions, among whom I will only mention Mauthner. Choroidal congestions are the effect of the same cause, which we notice after a long use of atropine, namely: vaso-motor paralysis which leads to an increase in tension, with the single difference, that in the one case it is chronic and in the other acute, while the ultimate result is the same as far as the eye is concerned. I have seen similar consequences of vascular paralysis from contusio bulbi, and from commotio cerebri, producing glaucomatous choroiditis after a long time. It cannot be too often pointed out that in all of these conditions there is a certain abnormal sluggishness of the pupil. As I was formerly not so familiar with these things, the absence of an excavation sometimes induced

¹ *Ophthalmologische Mittheilungen*, Berlin, 1874, p. 53.

me to abstain from an operation, especially when the sight was much improved by Heurteloups. Under just such conditions I have been astonished at finding large excavations at a later examination. I have therefore made it a rule for such conditions to perform iridectomy, because it prevents their prejudicial influence on the vision, and also does away with many other annoying symptoms which I formerly did not suspect to have any connection with the increased pressure in the eye; I mean such symptoms as occasional occipital pain, cardialgia, dyspnœa, circumscribed sensibility of the spinal column, spasms of the bladder, and the like, which, as we shall see later on, have to be considered as reflex symptoms.

It has already been noted that the excavation in many cases had not yet occurred at the time of operating. The operation almost always improves sight, but the excavation may come on a few years later, even without diminution of the acuteness of vision. It therefore appears that excavation of the papilla and changes in the tension of the eye are not necessarily dependent on each other. It is remarkable that I have never seen such high degrees of insensibility of the cornea in this glaucomatous choroiditis as in true glaucoma. This may, however, be accidental. Several times have I seen the development of keratitis glaucomatosa, both after iridectomy and (twice) after extraction of cataract. In rare instances the primary disease increases to the gravity of a glaucomatous chorio-iritis. The more quickly this form develops, the more dangerous it is.

Hirschberg's observations on metastatic choroiditis after septic puerperal embolism seem to be exhaustive. The eye complications all occurred at a time when the general condition was not yet very bad. The six cases which he reports, as well as the six cases which he cites from Hall and Higgingsbottom, terminated fatally. In one case only (Martin's), the patient recovered, but lost one eye. I remember three cases of my own practice, in two of which both eyes were lost, and in one only one eye, but since I was only consulting physician, I can not say what the final terminations were.

The embolic nature of the process has long been shown by Virchow, and Heiberg and Litten discovered the cause of the embolism to be bacteria.

If, with the foregoing, I conclude the clinical sketch of the influence of uterine diseases on the eye, it is with the full conviction that the subject requires continued and thorough investigation. The communication of chiefly personal observations has been intentionally chosen as best adapted to furnish data for a future general description, in monograph form, of a subject so eminently practical. Occasionally, I have already referred to therapeutical questions. It may, therefore, suffice to add a few general principles of treatment.

The rational treatment of hyperæsthesia of the retina is impossible when we do not know its exact cause. The development of this condition from diseases of the genital organs, from the influence of anomalies in form and position of the uterus, from the occurrence of inflammation of these organs and their adjacent parts, and the irritation which the ovaries can produce in the eye, show that the maxim of the Salernitan school, "*qui bene distinguit, bene medebitur*," applies particularly to this group of diseases. Local treatment of the eyes will have but little effect unless we can do away with the cause of irritation. To counteract the influence of sexual irritation, bromide of potassium and lupulin are excellent means. If the ovaries are the origin of the irritation, a good remedy is atropin. sulph. 0.03 with pulv. liquir. 2.5 and an addition of succ. liquir. or extr. tarax., made into 60 pills; one pill ($\frac{1}{120}$ grain) to be taken three times daily. Tinct. gelsemini and cannabis indica are excellent adjuncts. If the hyperæsthesia is caused by shrinkage after parametritis, no therapeutics have shown themselves of avail; whereas, if it is dependent upon dysmenorrhœa from a stenosis of the orifice of the uterus, early operative interference is the rational mode of treatment. If, in the absence of inflammatory symptoms on the part of the urino-genital system and its adnexa, monthly exacerbations of eye troubles appear, the elixir proprietatis Paracelsi can not be too highly recommended. Strong individuals can take half a

teaspoonful twice daily for months; weak ones or young girls take a few drops, or one quarter teaspoonful three or four days before menstruation. Colocinth and especially sabina have similar effects. The latter has long been used by the lower classes of society to produce abortion. All of these remedies serve a good purpose in these congestions which sometimes show themselves by a flying heat at the climacterium, complicated either with disturbances of accommodation or choroidal disease. The effect of coffee must be watched, for caffèin aggravates choroidal affections. If the uterus is hyperplastic, or the vaginal portion swollen, with a tendency to hemorrhage, leeches and scarifications have a good effect on the choroidal trouble, for, according to Röhrig's investigations, the depletion of the uterine ganglia regulates the peripheric circulation and thus indirectly favors the contraction of that organ. The portio vaginalis is the most eligible place for the application of leeches. In all forms of uterine hyperplasia, distinguished by rigidity and enlargement of the portio vaginalis, the amputation of the neck of the uterus, recommended by A. Martin, has a beneficial effect on the restoration of the organ to its normal condition.

Only when the disease in the choroid and retina is no longer perpetuated by the uterine trouble is it allowable to use Heurteloup. I know only of one form of visual disturbance, in which *a priori* it does not do harm; viz., anæsthesia optica, and even here great care must be taken in reduced and anæmic persons.

Iridectomy is not justifiable when the choroidal process has led only to a few synechiæ. It must be done, however, when they have become circular, but a regulation of menstruation sometimes cures all eye troubles immediately. If, on the contrary, the tension is increased, sclerotomy under eserine cannot be too highly recommended. I have abstained from all complicated methods of performing this operation, and have simply made an incision with a lance-shaped knife, as in the first step of an iridectomy. In the disturbances of vision caused by loss of blood we may obtain good results from convex glasses and eserine.

When the loss has been excessive, iron, ergotine, dec. ratan-hæ, etc., may be used. If these do not succeed, the uterus must be examined, for the trouble may have been brought about by increased vascularity and granulations in the portio vaginalis, or by endometritis hemorrhagica, or polypoid growths. Scarifications, cauterizations, injections of acetum pyrolignosum, or decoct. quercus, and, if necessary, operative treatment of the proliferations, are indicated. If the loss of blood is not only excessive but acute, retinal transudations and neuro-retinitis generally ensue. The proper uterine treatment is, of course, directed toward a cessation of the hemorrhages. The visual disturbances, stupor, and, perhaps, concomitant irritations of the roots of the pneumogastric require different treatment, consisting in such remedies as will strengthen the heart action, and in the application of warm cloths to the back of the neck. The effect of the latter is sometimes astonishing. It causes a rapid arterial flow, favors absorption of transudations, and commonly feels very grateful to the patient. If the disturbance is of a chronic character, cold compresses may be applied to the head, and covered with a double layer of dry woolen cloth, so that the subsequent heat produces a great supply of blood to the head. If in this way the transudation is diminished, subcutaneous injections of pilocarpine are to be recommended, especially when opacities in the vitreous are present.

For neuro-retinitis resulting from an acute inflammation in any part of the uterine system, ice bags to the head, besides the uterine treatment, are the best remedy. Impediments to the retinal circulation are most appropriately relieved by the application of a few leeches to the septum narium or the mastoid process, producing a direct depletion of the longitudinal or lateral sinus. To this medication may be added inunction of the neck with ol. crotonis, or ungt. tartari stibiati, and the internal use of saline remedies.

When the neuro-retinitis has subsided, the ice bags and the derivations on the neck are to be continued. A seton in the neck is to be worn in most cases, for it relieves more than any other derivative the visual disturbances resulting

from cerebro-meningeal congestion. Its effect is no less beneficial in those forms of neuro-retinitis occurring in anomalies of position of the uterus, with or without participation of the spinal cord. In all of these severer forms of disease systematic mercurial inunctions should be carried out—from 50 to 75 applications, according to the intensity of the disease, recommending the patient generous diet. So soon as the inflammation of the retina and optic nerve has disappeared, and the sight has improved, Heurteloups may be used, but rarely more than three times, and at long intervals. I have followed this method of treatment for fifteen years, and always with such results that I will never think of abandoning it.

In many of the cases the vertebræ, especially the first dorsal and the last lumbar, were sensitive on pressure. This condition was cured in most cases by blisters and irritative salves. For occasional fluxions toward the central parts, mustard plasters, rubbing of the skin with warm salt water, or else faradization was used.

If the foregoing medication has removed the active inflammation in the retina and optic nerve, we may use argent. nit. 0.15 in thirty pills, *ter in diem*, for many months, to counteract a tendency to atrophy. No other remedy will act so beneficially under conditions apparently so discouraging. Subcutaneous injections of strychnia can also be recommended, but not so much as silver nitrate. Strychnia has, however, the advantage of stimulating the nerves, especially the motor centers of the uterus, thus favoring the involution of uterine hyperplasia. Ergot has the same effect, but it must be used with caution, as it excites the pial vessels, and may, therefore, indirectly aid in the development of atrophic processes of the optic nerve.

If this paper should assist in drawing the attention of the profession to the influence of uterine disease in the production of visual disturbances, its purpose will be accomplished.

Dr. Mooren's valuable and suggestive paper, occupying 59 pages in the German edition of these ARCHIVES, had to be abridged in the English edition for want of space. The omissions mostly refer to cases cited by the author to illustrate his propositions.—EDITOR.

ON THE ANATOMICAL ALTERATIONS AFTER OPTICO-CILIARY NEUROTOMY.

BY DR. FEDOR KRAUSE,
ASSISTANT AT PROF. HIRSCHBERG'S CLINIQUE.

(*With plate v.*)

Translated by JAMES A. SPALDING, Portland, Me.

IT has long been known that an eye which has been subjected to optico-ciliary neurotomy regains its sensibility after an interval of some months. Prof. Hirschberg has already shown¹ that the intra-ocular portion of the ciliary nerves was normal in one case, which had twice been subjected to optico-ciliary neurotomy at another clinique than ours. Poncet² has further proved the regeneration of the extra-ocular portions of the ciliary nerves in a dog, two or three months after neurotomy. The same observer³ has also described the changes which occur in the inner tunics of the eye in dogs, rabbits, and frogs, in whom neurotomy has been performed.

I propose now to describe the anatomical conditions of four eyes which had to be enucleated by Prof. Hirschberg, after optico-ciliary neurotomy had previously been performed, either at our own clinique or elsewhere. The time between the two operations varied from two months to two years.

¹ These ARCHIVES, vol. ix, p. 395.

² *Le Progrès Médical*, Sept. 11, 1880; compare also *C. f. A.*, 1880, p. 321.

³ *Archives d' Ophthalmologie*, 1881, Jan'y-Feb'y.

CASE 1.—Helen H., æt. 9, was brought to us January 23, 1880, with congestive catarrh and a deep ulcer embracing the lower third of the left cornea. The ulcer soon healed under the influence of bandage, fomentations, and atropin.

February 2.—Sudden prolapse of iris in this region.

February 20.—A black convex mass is noticed beneath the extensive prolapse, and as it seems to be the lens, the prolapse is removed and an attempt made to extract the suspected lens by the narrow knife; loss of vitreous. The doubtful tissue was therefore prolapsed vitreous, the lens probably having been lost some time before. The wound healed nicely, but the eyeball began to be phthisical. Although this eye was not painful to pressure, the right eye soon showed slight pericorneal injection, but its vision was still unimpaired.

March 12.—Optico-ciliary neurotomy is performed very extensively on the left eye; recovery normal.

April 2.—The cornea and ciliary body are insensible to the touch. Still, the sensibility of these two tissues gradually reappeared, so that, as the child lived at a distance, the eye was enucleated June 24th, to prevent all danger of sympathetic inflammation.

The eye, as well as the others hereafter described, was hardened in Müller's fluid, and subsequently in alcohol. A vertical section is shown in fig. 1, plate v. *Macroscopically*, the cornea is united with the iris; the latter, with the shrivelled retina. The lens is absent, the sclera normal. The choroid is loosely attached at several points to the sclera, while at the intervening spaces it is entirely detached. The larger portion of the vitreous chamber is filled with an exudation, which, being closely adherent to the choroid, must in shrinking have started the previously mentioned detachment. A large hemorrhagic extravasation, which extends from the entrance of the optic nerve to the equator of the eye, separates the choroid from the exudation. The optic nerve appears to have undergone atrophy.

Microscopically the anterior portion of the cornea shows a few vessels which increase in number and size toward the cicatrix. Numerous round cells are also visible, while the anterior epithelial layer is thickened. Descemet's membrane bends sharply around upon the surface of the iris in the neighborhood of the cicatrix.

The cicatrix itself consists of highly vascular connective tissue,

united on one side with the pupillary border of the iris, and on the other with the tips of the ciliary processes. It then extends backward into a tissue rich in round cells and pigment, in which the capsule of the lens with a slight amount of amorphous lenticular substance is distinctly visible.

The ciliary body is dragged *en masse* toward the middle line, so that the ciliary processes appear elongated.

The iris is stretched longitudinally and attenuated above at its attachment to the ciliary body. In the middle it is bent backward at right angles. Both iris and ciliary muscle are infiltrated with round cells, so that the inner layers of the muscle are invisible to the observer.

The retina is entirely detached, totally degenerated, and lies in the anterior portion of the vitreous chamber. The various layers are with difficulty recognizable. The cavity within the retina contains several hemorrhagic extravasations, round cells, and pigment.

The vitreous is reduced to a mere transparent fibrous mass.

The exudation which occupies the vitreous chamber is amorphous, and closely united with the pigment layer of the choroid. The large extravasation reveals many perfect red corpuscles, and is separated from the pigment layer by a thin layer of exudation. The choroid is normal, with exception of slight thickening in the pigment epithelium.

Special attention was given to the optic and ciliary nerves, which were treated with hæmatoxylin, carmine solutions of alum, carmine ammoniac (with, as well as without, preliminary treatment with palladium chloride), and Leber's method with gold.¹

The arrangement of the optic nerve into separate bundles can no longer be accurately recognized. The septa are filled with a very fine net-work, rich in round, oval, and nuclear structures. Axis-cylinders can barely be discovered in the net-work, even with an intense carmine tinge. Longitudinal sections show the same structures in the mesh work.

The lamina cribrosa is very distinct. The nerve extends forward like a thread into the crumpled retina. No trace can be discovered of any reunion of the nerve where it had been severed during the first operation. Still, it was cut off very close to the eyeball, and during enucleation it may have been divided at about the same place as at the neurotomy. Gold preparations exhibited

¹ *Graefe's Archiv*, Bd. xiv, Abth. 2, p. 167.

a pale bluish-red color, while in the normal optic nerve, similarly treated, the nerve bundles were of a beautiful violet tint, and distinctly different in color from the interstitial connective tissue.

I next tried to dissect the ciliary nerves at the inner surface of the sclera, and succeeded in discovering two small stems near the entrance of the optic nerve, and laying them bare to their passage into the sclera. Teased-out preparations showed abundant nuclei and distinct medullary sheaths; axis-cylinders absent. I then prepared a series of sections of the sclera and posterior connective tissue in order to study the number and size of the ciliary nerves at the beginning of their distribution within the eye. The sections were made parallel to the plane of the original division of the eye, either in the horizontal or vertical meridian. With such sections we may obtain transverse, oblique, or longitudinal surfaces of the ciliary nerves and study their relations just as well as if we had laid them bare. Although the entire sclera was thus examined, the most important district is near the entrance of the optic nerve, where most of the ciliary nerves lie. Sections of the nerves inside the scleral tissue lie outside of the wound caused by the neurotomy.

The number of nerves in the most richly provided sections of the normal sclera (which were of course examined for the sake of comparison) is usually five or six. Longitudinal sections seem to show even a greater number. But these are really parts of a single nerve, which passes irregularly through the sclera, so that an intervening portion is occasionally lost in examining the surface of the section. Such a condition, however, is rare. The size of the ciliary nerves within the normal sclera varies at their entrance, according to Henle,¹ from 0.2 to 0.5 *mm.* I have thus measured them and found them to vary from 0.2 to 0.35 *mm.* The smallest ones near the posterior pole measured 0.05. *mm.*

Let us now return to our case. In the first place, there are *more* ciliary nerves than in the normal eye. I saw many sections which contained eight or ten nerves, while there was not a single one without at least four. In normal preparations, on the contrary, it is by no means unusual to find *only a single nerve*. Still, this increase in our case is too slightly pronounced for us to lay great stress upon it.

In the second place, the size of the nerves varies greatly from the normal. In our case a great majority of the nerves are small.

¹ "Handbuch der Nervenlehre des Menschen," p. 404.

Hardly a single nerve measures more than 0.22 *mm.* in diameter ; all the rest are decidedly smaller, even so small as 0.023 *mm.* I would remark additionally, that for these measurements I always used transverse sections.

Histologically, most of the nerves appear normal (plate v, fig. ii, *a* and *b*). Here we see within the perineurium distinct tracings of the medullary sheaths and axis-cylinders, only the ganglia are rather more numerous than natural. The largest nerves (0.22 *mm.* in diameter) also seem to be normal. After treatment with gold chloride the nerves assume a beautiful violet color, which is, however, a trifle fainter than in normal nerves. Some of the nerves (fig. ii, *c*) of a medium diameter (0.1 *mm.*) show distinct traces of medullary sheaths and numerous nuclei ; but only in a portion of the sheaths—sometimes in the larger, sometimes in the smaller—do we see sharply defined axis-cylinders. The gold reaction occasionally fails to a greater or less degree in the smaller nerves, while in glycerine preparations the medullary sheaths are much more transparent than in normal nerves.

CASE 2.—Marie W., æt. 10, had been injured in the left eye several years before, but was not at the time professionally treated.

Sept., 1878.—The right eye was normal, the left phthisical.

Sept. 17, 1878.—Neurotomy was performed. The cornea at once became perfectly insensible.

A few months later the artificial eye could not be worn on account of the pain which it caused. The ciliary region was sensitive to the touch, and the cornea appeared to have regained its sensibility. As the child was about to return to India, enucleation was performed for security.

Jan. 15, 1880.—The recovery was good, and the artificial eye well borne.

The eyeball (plate v, fig. iii) measures 17.5 *mm.* in its antero-posterior diameter, 20 *mm.* in its equatorial.

The lamellar structure of the cornea is lost at the centre. Cornea and iris are united, anterior chamber abolished, Descemet's membrane preserved.

The iris is incarcerated in the corneal cicatrix, and extremely attenuated toward the periphery. Behind it lies an amorphous exudation.

The ciliary body is pushed far forward ; its processes are elongated. The shrivelled capsule of the lens lies in the space

formed by the iris, ciliary body, and retina. The remaining portion of this space is filled with an amorphous exudation which contains a few round and numerous pigment cells.

The retina is completely detached, lies close behind the ciliary body, and sends a prolongation backward into the vitreous chamber. Its normal structure can barely be recognized, marked as it is with extravasations and considerable brown and black pigment. Only a trace of the vitreous body can be discovered. The vitreous chamber is filled with an amorphous exudation which adheres to the irregular surface of the pigment epithelium. The marginal layer of the exudation also contains pigment cells and hemorrhagic extravasations. The hardening process has shrivelled the exudation, and thus undoubtedly separated the choroid from the sclera, which is normal.

The bundles of nerve fibres in the optic nerve are almost entirely absent ; they terminate anteriorly, in a clump of round cells which lie at the locality of the normal optic papilla, posteriorly in thick-meshed vascular connective tissue, which is everywhere closely united with the inner sheath of the optic nerve. The nerve itself terminates in a club-shaped knob. This connective tissue is evidently of cicatricial origin, subsequent to the neurotomy.

Cross-sections of the nerve show small dark islands of fibrous tissue lying in the midst of a clear substance, which contains numerous nuclei of various shapes. The islets exhibit fibres which bear only a slight resemblance to those in the normal optic nerve.

The ciliary nerves are considerably increased in number ; 14 to 22 in a scleral section, and no section with less than 5. Plate v, fig. iv, shows 12 nerves, and at another part of the figure a complex of very minute nerves which can only be reduced into separate stems with a high power ($\times 250$). But no matter how small the nerve, it always shows a distinct perineurium, and is, moreover, separated from its neighbor by scleral tissue. The number of nerves in this group is about 30 ; in the whole section about 40. Most of them measure about 0.02 mm ; some with four or five primitive nerve fibres measure 0.01 mm, while others have a diameter of 0.06 mm. The variations in size of the nerves in this case is from 0.025 to 0.2 mm. One only is 0.2 mm. in diameter ; the average is from 0.025 to 0.08 mm.

Histologically, all of the nerves are normal, except that they are

somewhat richer in nuclei. Axis-cylinders and medullary sheaths are distinctly visible, and the coloring with gold-chloride well marked.

CASE 3.—A man, æt. 55, lost his left eye from an affection of the cornea incident to small-pox in 1871. In 1879 optico-ciliary neurotomy was performed at another hospital on account of violent pain. In 1881, Prof. Hirschberg enucleated the eye on account of the typical and well-marked sensitiveness of the ciliary body to the touch.

The eye (plate v, fig. 5), measures 12.5 *mm.* in its antero-posterior diameter, 16 *mm.* across.

The centre of the cornea is occupied by a cicatrix in which lies the capsule of the lens. The cornea is normal, except in increased vascularity.

The iris is full of round cells and closely applied to the cornea.

The ciliary processes are elongated, the muscular fibres almost entirely absent, and the whole substance filled with round cells.

The choroid has disappeared, with exception of the pigment epithelium and a wide-meshed connective tissue.

The retina is degenerated and filled with round cells and clumps of pigment.

The optic nerve is totally atrophic and filled with round cells.

The ciliary nerves are not more abundant than normal, but there are more small nerves than large. The largest nerve measures 0.32 *mm.*, the average measurement being 0.02–0.06 *mm.* Each large nerve seems to be accompanied by two small ones of about 0.02 *mm.* diameter, separated from the former by the perineurium. I have not previously met with this arrangement in the normal sclera, nor did I discover it in any of the other cases. Histologically, the ciliary nerves are normal.

CASE 4.—Has already been reported by Prof. Hirschberg¹ at the Tenth Surgical Congress at Berlin, so that I merely repeat the essential data. March 26, 1881, a man, æt 18, came to the clinique saying that a bit of iron had struck his right eye two days before. $S = \frac{1}{6}$.

Although a foreign body cannot be seen in the yellowish and infiltrated vitreous, there is no doubt that it lies somewhere in the eyeball.

March 27th, the foreign body weighing 3.5 mgr. is removed at the third attempt with the electro-magnet, after making an incision between the rectus inferior and externus.

¹ *V. Langenbeck's Archiv.*, Band xxvi, Heft 3.

March 28th, eye free from pain ; chemosis, and exudation covering the iris and pupillary field.

March 30th, chemosis and exudation absent ; vitreous transparent, upward ; the eye distinguishes light and darkness.

April 16th, slight pericorneal injection, no chemosis, cornea clear, anterior chamber free, a few specks of exudation on the anterior capsule. The iris is slightly swollen, pupil of medium width, with a few thin synechiæ ; lens transparent. The vitreous is marked by a yellowish purulent connective-tissue mass, which has advanced nearer and nearer to the lens, and looks very green by daylight. —*T*₂. The ciliary region, outward and downward, is sensitive to the touch. Spontaneous headaches, especially at night, on the side of the injury. *S*=0.

Under these circumstances sympathetic ophthalmia seemed imminent. But as the relatives would not consent to enucleation, an extensive optico-ciliary neurotomy was performed April 16th. Cornea and ciliary region insensible to the touch ; absence of headache.

May 6th, cornea transparent, with exception of a few folds visible only upon focal illumination. The yellowish opacity in the vitreous appears vascular. The eye grows atrophic.

May 20th, vessels are visible in the hazy cornea, which remains free from sensitiveness till June 13. The ciliary region is now tender to pressure, and enucleation is therefore performed June 15th with the patient's consent.

The eyeball (plate v, fig. 6) measures 14 *mm.* antero-posteriorly, 18 *mm.* across. The cornea is wrinkled visibly to the naked eye. The contours of the sclera are irregular and nodular behind. The tissue behind the eyeball is thickened, contains numerous extravasations of blood, and is so closely adherent to the sclera and optic nerve that the latter is barely visible. The anterior chamber is narrow on one side. The iris is applied to the anterior capsule. The ciliary body appears to be separated from the sclera by a structure which completely embraces it, and extends further backward.

At the periphery of the eye the choroid and retina can no longer be distinguished as separate layers. The lens looks just as if a smaller plano-convex lens had been applied to its posterior surface. Behind this lies a firm yellowish mass which occupies the rest of the vitreous chamber.

Microscopically, the cornea is normal, with exception of a num-

ber of new vessels, which are more numerous toward the limbus, and then pass over to the extremely vascular conjunctiva. Many clusters of round cells are scattered loosely about, together with extravasations of blood and bits of pigment, which are evidently the remains of red corpuscles. The stumps of the muscles, as well as the retrobulbar and interstitial tissue, are infiltrated with round cells and extravasations of blood.

The parallel arrangement of the scleral fibres has disappeared. Those which can be seen are irregularly curved. The posterior portion of the sclera is most altered: the vessels are more abundant than normal; clumps of pigment and extravasations abound, together with cells both spindle-shaped and stellate, from the pigmented stroma cells of the choroid.

The iris is nearly normal.

The ciliary body is infiltrated with round cells, which have stretched apart the muscular elements. The tissue which separates the ciliary body from the sclera is essentially composed of star-shaped pigment cells. The mesh work which contains them is filled with a granular and indistinctly striated exudation in which some round cells are embedded. The tissue previously mentioned extends backward into the choroid, where it appears as the thickened stroma layer of the latter tunic.

The choroid has undergone complete transformation, and is intimately connected with the sclera. It varies in thickness from 0.2 to 0.8 *mm.* The pigmented stroma cells are most extensively altered, and are so close together that their contours are indistinct and transformed into a fine net-work, with traces of hemorrhagic extravasation. Sometimes the meshes are coarser and crowded with round cells. The chorio-capillaris is also full of pigment cells. It contains a large number of vessels with thin walls, extravasations of blood and clumps of round cells. The other portions of the choroid are unaltered except in conformation.

The retina is partly detached from the pigment layer of the choroid. It has lost its normal appearance, the two granular layers alone being recognizable. Müller's supporting-fibres have undergone transformation into long thin fibres. The whole tunic is crowded with blood coagula, small flakes of pigment, and migratory pigment cells. A neoplastic connective tissue lies next to the retina in front, fills in the whole space between the latter and the lens, and extends uninterruptedly into the cicatrix caused by the magnet operation.

The cicatrix first appears in horizontal sections, which have struck the lens at its lower third. It is about 1.5 *mm.* wide, traverses the tunics of the eyeball, and extends like a ribband into the tissue lying between the posterior capsule and retina. The sclera is drawn toward the cicatrix, which is composed of fibrous connective tissue, rich in nuclei and vessels. In the episcleral tissue, the cicatrix is slightly marked. The choroid lies outside the cicatrix, while the retina is adherent to it. The cicatrix extends into the tissue which occupies the vitreous chamber, and is evidently the degenerated vitreous humor. The lens is nearly normal, with exception of slight pigment upon the anterior capsule.

The optic nerve in the anterior layers of the retina looks like a dark thread, with longitudinal rows of round cells. Further forward it resembles a narrow band. Posteriorly it terminates just behind the middle of the sclera, near some hemorrhagic extravasations which rest upon the scleral and retro-bulbar tissues. Still further backward we come upon a portion of the nerve which was separated from the eyeball by the operation. The bundles of nerve fibres in this portion of the optic nerve are quite distinct, although pale on longitudinal sections, while on cross-sections the axis-cylinders and medullary sheaths can hardly be recognized.

The ciliary nerves were examined, not only in scleral sections, but in the retro-bulbar tissue. Their average number in each scleral section is normal. In the retro-bulbar tissue, lying wholly behind the cicatrix caused by the neurotomy, they average five or six of normal size (0.18 to 0.38 *mm.*), and are otherwise *perfectly normal*. Those in the sclera vary in size from 0.1 to 0.17 *mm.* About one half of them are normal. The others (fig. 7) exhibit a fine net-work which differs essentially from the normal medullary sheaths. Their axis-cylinders are almost entirely absent. These nerves were evidently originally present in the sclera, and underwent atrophy after the neurotomy.

It is quite difficult in each of these four cases to tell which alterations are to be referred to the original pathological process, and which to the neurotomy. It is plain, however, that the atrophy of the optic nerve must have begun before the operation was performed.

The condition of the ciliary nerves is of most importance, and I am confident that the alterations which they display are the direct result of the neurotomy. The only objection

which can be raised is that in the case of severe injuries of the eye which caused marked alteration in its tunics, and finally phthisis of the eyeball, the ciliary nerves may be found in precisely the same condition as in the cases now under discussion.

In order to answer this objection I have examined the sclera of an eye, which I have already described in these ARCHIVES (vol. xi, p. 173, etc.). Inasmuch as a severe injury in this case caused extensive thickening of the choroid (2 mm.), I have the right to assume that if the ciliary nerves had undergone proliferation even after a traumatism, they would have exhibited their share in the inflammatory process by distinctly pronounced interstitial inflammation. But it happened that the number and size of the ciliary nerves were here normal. It is plain, then, so far as this case can prove it, that the neurotomy alone induced the alterations in the ciliary nerves which we see in the series of cases now under observation.

In order to decide the question of regeneration of the ciliary nerves after neurotomy, we must glance briefly at the results which have been experimentally obtained.

Almost all late observers agree that the peripheral stump undergoes degeneration after neurotomy. Schiff¹ and Bruch,² however, assert that the nerves may occasionally reunite by first intention without preliminary degeneration, and Glück³ has lately observed direct reunion of the severed ends of the nerve after the careful application of a catgut ligature. Such a possibility, however, cannot be considered in our case. For even if the eyeball were rotated to its original position after neurotomy, it can scarcely be believed that the same central and peripheral nerve stumps would rest precisely against one another, and the idea becomes impossible when we purposely, as in the three cases of Prof. Hirschberg, cause the eye to deviate from its normal position by advancing the tendons of the external or internal recti.

¹ *Archiv für gemeinsch. Arbeiten*, Band ii, p. 411.

² *Zeits. f. wiss. Zoölogie*, Band vi, p. 135.

³ "Experimentelles zur Frage der Nervennaht und Nervenregeneration." *Virchow's Archiv*, Band lxxii, p. 624.

In considering the regeneration of nerves Neumann¹ is of the opinion that endogenous formation of daughter-fibres within the old and degenerated nerve fibres takes place in the peripheral as well as in the short central stump which had, like the other, first undergone degeneration. He thinks, moreover, that these neoplastic fibres grow out toward one another from both sides, and traverse the granulation tissue which unites the stumps of the nerves, in which process the tissue itself plays a passive role. Eichhorst² dissents from this view only as far as to assume that the interval between the two ends of the nerve is bridged over by the outgrowth of *central* fibres alone. Finally, Waller and Ranvier³ unite in the view that the fibres springing from the central stump press onward through the cicatricial tissue to the peripheral stump which they then penetrate.

The anatomical conditions in our cases can only be explained by Ranvier's theory. The new formation in the intra-ocular surfaces of the ciliary nerves starts from the central stumps which lie in the tissue behind the eyeball, and were normal in our fourth case excepting in the number of nuclei. The primitive nerve fibres of these stumps then push forward, but it is doubtful whether all of them touch their appertaining peripheral stump, since the globe has been purposely brought into a deviating position. They then simply grow into the eyeball, following those paths which offer the least resistance. Under these circumstances, therefore, they will not advance together in large numbers, as is the case with the normal ciliary nerves which are united by interstitial connective tissue, but in smaller groups. This view will explain the characteristic condition in our second case especially, in which, although there are more than the normal number of ciliary nerves in the scleral section, a majority of them are composed of comparatively few primitive nerve fibres. The latter, moreover, have not, in my opinion, entered the eyeball in the normal arrange-

¹ "Degeneration und Regeneration nach Nervendurchschneidungen." *Archiv der Heilk.*, Band ix, p. 193. "Ueber Degeneration und Regeneration zerquetschter Nerven." *Archiv f. mic. Anatomie*, Band xviii, p. 302.

² "Ueber Nervendegeneration und Nervenregeneration." *Virchow's Archiv*, Band lix, p. 24.

³ "Leçons sur l'histologie du système nerveux," tom. ii, p. 71.

ment. The nerve fibres also may have become more numerous, as has lately been observed in the experiments of E. Neumann and others on nerve sections in rabbits. But this could not be positively demonstrated, unless we could actually compare the number of axis-cylinders in the ciliary nerves behind the eyeball with that which they exhibit in the sclera. It is of course quite possible for the neoplastic fibres of a central stump to impinge precisely upon any given peripheral stump. The regeneration would then proceed as in experiments with animals when the two stumps have previously been allowed to remain in apposition. The regenerated nerve fibres, under such conditions, push forward in the track of the old ciliary nerves, and being thus reunited to a nerve obtain a diameter equal to that of a normal ciliary nerve. This would explain the discovery in scleral sections of a few large cross-sections of nerves in addition to the abundant number of smaller ones. The latter condition might also be referred to Neumann's theory of regeneration: if the endogenous regeneration of fibres has taken place in the peripheral stump, the central and peripheral fibres could unite with one another. I am of course well aware of the boldness of this view, for we thus assume that fibres which originally appertained to different nerve tracts would here unite with one another.

We may say, generally, that the peripheral (those in the eyeball) nerve stumps undergo total atrophy.

This is shown, *e. g.*, in our fourth case, in which enucleation was performed two months after neurotomy. The number of atrophic nerves is here but little less than that of the nerves in a section of the normal sclera. Poncet, at the last International Congress in London, mentioned a case in which the nerve fibres had undergone fatty degeneration after neurotomy. The nerves which were found in the cicatricial tissue dependent upon the neurotomy showed interstitial sclerosis with inflammatory compression of the nerve fibres. Personally, I have not as yet met with analogous alterations.

The case in which atrophic nerves are present exhibits other nerves which do not differ histologically from those

which are normal, except in abundance of nuclei. The regeneration of these nerves has therefore advanced so far after two months, that we can demonstrate them in the sclera. After three months and a half (our first case), no more atrophic nerves are visible; but the regenerated nerves, which are abundant, are not yet entirely normal. Their medullary sheaths in glycerine preparations are less opaque than normal, while only a few of them possess axis-cylinders. Additionally, the nuclei are still very distinct, a condition still undeniably present even after fifteen months (our second case). After two years, the regenerated nerves do not differ in any respect from those which are normal.

Explanation of Figures (Plate V).

Fig. 1.—Vertical section of the eye of CASE ONE; natural size. 1, Cornea. 2, Scar of marginal ulcer. 3, Detached retina. 4, Sclera. 5, 5, Choroid. 6, Amorphous exudation. 7, Extravasated blood. 8, Optic nerve. 9, Iris.

Fig. 2.—Transverse section of a ciliary nerve from the same case. 275 diameters; *a*, larger, *b*, very small normal nerve. In *a*, a portion of the nerve fibres have been cut obliquely. The drawing is but partially completed; increased nuclei; *c*, nerve with distinct medullary sheaths and numerous nerve-granules and scattered axis-cylinders.

Fig. 3.—Horizontal section of the eye in CASE TWO; natural size. 2, 2, Detached retina. 3, Amorphous exudation.

Fig. 4.—Piece from the posterior segment of the sclera in CASE TWO. 30 diameters. Numerous transverse sections of nerves of varying size. At the right, under higher powers, we see many transverse sections. The vessels and cells of the scleral tissue have been omitted for the sake of clearness.

Fig. 5.—Section of the eye in CASE THREE; natural size. 1, Cornea. 2, Pigment epithelium greatly proliferated. 3, Optic nerve.

Fig. 6.—Horizontal section of the eye in CASE FOUR; natural size. 1, Cornea. 2, Sclera. 3, 3, Ciliary body. 4, Choroid and retina. 5, Lens. 6, Ciliary body degenerated into connective tissue. 7, Optic nerve.

Fig. 7.—Transverse section of an atrophic ciliary nerve from CASE FOUR. 275 diameters. The nuclei and axis-cylinders have been tinted. The axis-cylinders within the fine mesh work can barely be distinguished.

CONGENITAL PARALYSIS OF THE SIXTH AND SEVENTH PAIRS OF CRANIAL NERVES IN AN ADULT.

By JULIAN J. CHISOLM, M.D., OF BALTIMORE, MD.

Miss M. A., aged 35, has recently applied for treatment at the Presbyterian Eye and Ear Hospital. She has for some time found reading and sewing difficult, even with glasses. Her annoyance is hyperopia, which stronger spectacles than those which she has been using will altogether correct. Her case presents other peculiarities of a very interesting nature. At the first glance my attention was immediately attracted to her curious facial appearance, and to the singular fixed stare from her eyes. This was made more conspicuous by a sinking in of the conjunctiva at the nasal side of each socket, between eyeball and nasal bone, with total absence of the caruncula. On the exposed inner side of each eyeball was seen a prominent vertical white ridge, which was located upon the sclerotic, about two and a half lines from the inner edge of the cornea. In testing the various movements of the eyes, I found the upward and downward motions perfect, but there was no lateral movement whatever, so that she could not look either to the right or to the left, even to the slightest extent, without rotating the head. She never remembers to have done otherwise.

When young she had had an excessive squint, both eyes turning in toward the nose; a deformity with which she was born. While still a child her crossed eyes had been operated upon and the deformity removed, but she does not remember being able ever to move her eyes from side to side. The external recti muscles appear never to have been innervated, and the action of the internal recti has been destroyed by the squint operation.

The case is one of congenital paralysis of the external rectus on each side, causing in early life forced convergence from want of muscular antagonism. In the operation performed for the correction of the squint, the prominent ridge now present on the inner face of each eyeball, composed of the tendinous attachment of the inner rectus, shows that a myotomy and not a tenotomy had been practised. The vertical incision had divided conjunctiva as well as muscle to such an extent, that by contraction and retraction the muscular continuity to the eyeball had been destroyed. This freed the eye from the contractile influence of the displaced muscle. This old method of operating for squint was often the means of converting the convergent into a divergent form, a very common sequel of former squint operations. In this particular case, the free section of the contracted muscle accidentally became the proper operation. When it destroyed the inner rectus as a motor oculi it permitted the eyeballs to assume a central position, which from absence of muscular influence they have retained as a permanent state since the day of operation.

The curious vacant expression of face is not altogether due to the want of lateral movement in the eyeballs. Upon inquiry I found that she had never been able to close her eyes, but in attempting to do so only rolled the balls upward under the superior lids, indicating facial paralysis of each orbicularis palpebrarum. This condition has existed as far back as she can remember. She says that she was born with it, as she was with the cast in her two eyes. The skin of the face is smooth, without a single corrugation from the brow to the mouth. Having no face movements, owing to paralysis of all the facial muscles, she is incapable of expressing any emotion whatever. Below the angles of the mouth some wrinkles can be voluntarily produced, but none in the face proper. In puckering the mouth, while attempting to whistle, the upper lip remains a smooth horizontal curtain, the lower lip being corrugated. This partial paralysis of the face muscles is an indication that some of the fibres of the facial nerve on each side of the brain have escaped degeneration and preserve their accustomed action.

This rare nerve lesion is clearly a congenital paralysis of the 6th and 7th pairs of cranial nerves, complete as to the 6th, partial as to the 7th, and symmetrical as to the two sides of the face.

When one remembers the very close relations which the 6th and 7th nerves sustain in their cerebral origin, the same accumulation of ganglionic cells in the floor of the 4th ventricle, seemingly the starting-point for nerve fibres that form each of these motor cords, the explanation is easy for the conception of a pathological lesion which might influence, even to suppression, the peripheral excitation supplied from this source. Facial paralysis and loss of power in the external rectus muscle are common forms of paralytic action, possibly among the most common of the entire muscular system. The extreme infrequency with which the loss of action in these two motor nerves is found combined, notwithstanding the fact that they have a common origin, shows how much more frequent is the peripheral cause of the paralytic affection, when contrasted with its central origin. To be sure, a very small blood clot, or a very restricted inflammatory degeneration may invade this small centre of gray matter in the floor of the 4th ventricle from which these two nerves originate, without affecting other contiguous nerve centres which abound in this contracted ventricular region. Such is, however, a very rare lesion. There is no case on record, that I am aware of, in which the pathological process has extended to the very small but very important ganglionic centre, involving the identical and exclusive spot on each side of the median line. A defect so symmetrical could only occur during the development of the cerebral mass. In the case as reported we find a condition in which while the brain and its appendages appear in every way normal and healthy a small spot of gray matter in the floor of the 4th ventricle, one on each side of the median line, has never been developed, and the 6th and 7th pairs of cranial nerves, which should receive their vital influence from this nerve centre, have, therefore, no cerebral origin.

CATARACT-EXTRACTION WITH IRIDECTOMY IN AN INFANT SIX MONTHS OLD.

By JULIAN J. CHISOLM, M.D., OF BALTIMORE, MD.

Mrs. R's infant, a perfectly healthy child, six months old, was not attracted by bright objects as were other children. Those who saw it thought that the child was blind, and to satisfy the parents the child was brought to me to have the doubts solved. Although the pupils were well contracted, their whitish appearance indicated the character of the trouble, which a drop of atropia soon made plain. It was a double congenital cataract, with complete degeneration of the lens. It differed curiously in one respect from congenital cataract. It was gray instead of white, with sharply defined segmentation by striæ passing from centre to periphery. Each lens was similarly marked, which indicated a substance of considerable consistency. I suggested to the mother that the sooner an operation was performed for the restoration of sight the better for the child, to which she at once acquiesced. Under the anæsthetic influence of bromide of ethyl the needle operation was performed. In the right eye there was nothing unusual in the operation. In the left I noticed that the needle knife did not make much impression on the lens substance, but that the lens was readily moved from its position, the suspensory ligament having ruptured. Atropia was instilled and a wet cloth compress applied. The child did not seem in any way disturbed by the operation or by the anæsthesia. The operation did not occupy more than a minute, and the anæsthetic influence, although deep for a couple of minutes, was very evanescent. In a very short time the child was as bright as usual.

On the following day, when the bandages were removed, I found, to my surprise, that each lens was in the anterior chamber and in

its respective capsule, with pupil fully dilated, and no scleral injection whatever from the puncture of the previous day. I watched the case carefully for two days to see whether the lenses would change position, but there they remained, as if fixed against the inner face of the cornea, exhibiting conspicuously the striations and segmentations which had been previously observed. The serious character of this recent complication was fully appreciated. The patient had been brought from a distant country town ; the first child of a young and inexperienced mother, who was very solicitous that sight should be given to her first-born. I could not send the case home to await the absorption of a hard lens luxated in the anterior chamber of each eye, with the danger of irritative iritis, and to be under the care of a family physician of little experience, who seldom had a diseased eye to treat ; nor could the mother remain any length of time from her home duties. I therefore determined to extract both lenses, and at one sitting, a double operation, which I condemn as a rule, and therefore very rarely perform.

As a preparatory step I used eserine to contract each pupil and close up the aqueous chamber for the better securing of the lenses. With pupils well contracted and under the full anæsthesia of chloroform I made in the right eye the usual upper linear corneal incision, keeping well on the clear cornea to prevent, if possible, iritic protrusion, and with the expectation of getting the lens out without disturbing the iris. With the completion of the corneal section there came a gush of aqueous, and with it a large hernia of the iris, which necessitated the usual iridectomy, as in extraction of senile cataract. By making the usual curette pressure, an attempt was made to deliver the lens in its capsule, but it was firmly held by the remains of the suspensory ligament and would not advance. The capsule was then freely opened, when the lens slid out in its entirety and was delivered, as in the hard lens of old age, retaining its segmented masses in firm cohesion. The operation otherwise was a perfectly smooth extraction, in every way satisfactory. The coloboma was small and pupil perfectly clear, as there was no cortical substance to leave in the eye.

With this extraction completed the speculum was introduced into the left eye when the infant began to be restless, and more chloroform was administered. The corneal section in this eye was equally followed by an iritic hernia necessitating an iridectomy. This lens also would not yield its position to pressure,

and the cystitome was freely used to open the capsule. At this stage of the operation the patient again became restless, and a third inhalation of chloroform had to be made. When narcosis was re-established it was found that the vitreous was escaping from the corneal wound. Any attempt to deliver the lens by pressure caused very free oozing of vitreous. The capsule having been fully opened, I thought it better to leave the lens *in situ* rather than risk the introduction of a spoon or hook. Eserine was dropped in each eye; the lids were closed by elastic compresses, and cold-water dressings were continuously used.

The progress of the case was watched by me with unusual anxiety. The large amount of chloroform necessary to keep up anæsthesia, fully 2 oz., caused nausea and vomiting, which continued for 24 hours, accompanied by great restlessness and continual crying. The child had acquired the habit of rubbing its eyes with its closed hands. To avoid danger from the continuance of this habit, it was necessary to secure the hands by tying them to the child's body. This restraint added much to the many causes for restlessness which the operation has induced. The eye cloths were removed once a day for a momentary inspection of the lids and to examine for discharges. It was always followed by a fit of crying from which the infant could with great difficulty be pacified. An accompaniment to the other troubles of the infant came from the delicate health of the mother. She found that the intense excitement under which she was laboring soon broke her down and did not add to her milk secretion, which was the only food that the baby would take. Recourse was had to the soporific action of laudanum which was given to the child in one-, two-, and three-drop doses. It succeeded only partially in keeping him quiet. In the daily change of the eye dressings I dared not look into the eyes on account of the irritable disposition of the child. To keep him still when the bandages were in any way handled was quite out of the question, and, although extremely anxious to know what damage the constant crying had effected, especially in the left eye, from which the vitreous had escaped, and in which the lens remained, I had to be satisfied with inferences drawn from the momentary inspection of the face and lids and the examination of the cloths when removed once a day from the eyes.

As there had been no evidences of inflammatory reaction, I ventured on the 6th day from the extraction operation to remove

the bandages and allow the child of its own accord to open its eyes so that I might inspect them. To my delight I found the results perfect and very far beyond my expectations. In the right eye there was not a trace of injection. The brilliantly black pupil, of normal size, with iridectomy completely concealed by upper lid, contrasted conspicuously with the sharply defined white sclerotic. The white of this eye was as clear as it had been before the needle operation, and gave the appearance of a most successful cataract extraction as it is seen months after its performance. The left eye, in which the lens remained, also looked remarkably well. In this there was some little pink injection, but no evidences of adhesive inflammation of the iris. There was every prospect that in time this eye would also become good by the disappearance of the lens through absorption.

I heard from the case one month after the operation. The convalescence had been uninterrupted, no inflammation having made its appearance.

This cataract-extraction on so young a subject, although the most anxious in my experience, is also most instructive, illustrating in a very striking manner the recuperative power of infantile tissues under surgical procedures. It is one of the youngest, if not the very youngest patient upon whom the operation of cataract-extraction with iridectomy has ever been performed. The operation in the right eye was smooth, leaving a clear pupil, as the lens came out of its capsule entire, and was of such firm consistency throughout as to leave behind no particle whatever of cortical matter. The loss of vitreous in the left may be partly explained by the restlessness of the child and the very evanescent effect of the chloroform narcosis, however deep it seemed for the moment.

I have now had a very large experience in cataract-extractions, extending over twenty-five years of active surgery. In my early professional life cataract operations were few. For many years back they reach nearly 100 annually; so that I can safely say that my experience will now cover nearly if not quite 1000 cases. With very rare exceptions I administer chloroform to all my cataract patients, only omitting it when they expressly desire to have the operation

performed without artificial sleep. Such persons in my experience form the very rare exceptions; so that I administer chloroform to at least 90 out of 100 cataract patients, possibly 95 per cent. of those upon whom I operate.

I have never had cause to regret the administration of chloroform in any one single instance, but in some of the cases in which the operation of extraction was performed without its help I have wished that it had been used, as I am sure that the various steps of the operation would have been completed with much more ease to myself and safety to my patient had he been anæsthetized. My chloroform administrations will now exceed 12,000, and I have never had a serious accident from any one of these inhalations. I give it carefully and fearlessly to every patient who requires a painful operation, whether young or old, strong or weak, sick or well, with sound heart or diseased heart. In fact, I refuse it to no one who applies to me for operation. I use chloroform exclusively for all operations except the minor ones that can be perfected in a few seconds and for which I now use the bromide of ethyl, because the narcosis from it is equally deep with chloroform and much more evanescent. I administer chloroform daily, believing it to be the very best and safest of anæsthetics. With adults I invariably preface its administration with a large drink of whiskey. It is the combined influence of whiskey and chloroform that I have found so safe and satisfactory.

Vomiting is not an uncommon sequel of chloroform anæsthesia, and yet I cannot say that I have been able to trace the loss of a single eye to this cause. I am often stopped by vomiting in the midst of the operation, after the corneal wound has been made, but before the lens has been extracted; knowing that this accident might occur during cataract operations I never commence without having compresses of cotton at hand. A compress over the eye held gently with the hand till the vomiting ceases, and a new inhalation of chloroform (which by the by I push while the patient is hanging over the basin, as a means of stopping the more rapidly the emesis) enable me to complete the extraction with comfort and with safety. I have

never had loss of vitreous from vomiting that I can now recall. I attribute this to quick perception in recognizing the fact that vomiting is about to take place, when, anticipating the act, I remove the speculum and apply the handful of raw cotton over a wetted cloth. During the operation of cataract-extraction I have often seen loss of vitreous, much more frequently in former years than now, and coming on when no vomiting had taken place. This is an accident much more common with the beginner in eye surgery, and which the experienced in the handling of eye instruments seldom encounter.

I have had destructive retinal hemorrhage on but one occasion from cataract operations, three times after iridec-tomies for glaucoma, and that after a perfectly smooth cataract-extraction in an eye that had been partially clouded by previous attacks of inflammation in a hospital patient well advanced in years. This patient was under deep chloroform narcosis. The operation was a quick one and in every way smooth. The speculum had been removed, compresses applied and the retentive bandage put on. The adjustment of the linen cloth immediately upon the lids was not as nice as I would have liked, so I removed the compress to readjust it, when I noticed that the linen was very wet. I lifted it to find quite a pool of vitreous, with blood just beginning to show itself between the edges of the lids. In separating the lids blood was seen oozing freely from the corneal opening, with the chambers full of blood. Very fortunately for me I had told the patient that owing to the condition of the cornea it was doubtful whether the operation would give him sight. I made up my mind at once that the best course to pursue, to protect him from a painful panophthal-mitis and a very tedious convalescence, was to enucleate without delay. He was still influenced by chloroform under which narcosis the removal of the eyeball was effected.

With my very little patient no trouble came from the vomiting, although it continued for 24 hours, on account of the large amount of chloroform inhaled. The constant crying, except when under the soporific effect of laudanum,

made me much more anxious. I knew that the crying of infants did not excite the degree of eye congestion, which accompanies the continued weeping of adults. But this crying was so constantly the state of my infant patient that I feared the worst results from it. Fortunately for me, and especially so for the little boy, crying did not influence the results of the operation in any serious way whatever, and the immediate sequel, after the expiration of a week, exhibited to me one of the very best results that could be obtained. This good fortune to him has now become permanent.

LONG-CONTINUED PRESENCE OF A SPICULUM OF COPPER IN THE CORNEA WITHOUT EXCITING APPARENT IRRITATION.

By WM. SHAW BOWEN, M.D., OF PROVIDENCE, R. I.

THE publication by Knapp (vol. xi, No. 2, ARCHIVES OF OPHTHALMOLOGY) of the innocuous lodgment of a fragment of steel in the cornea for two years, affords an excuse for the mention of the following instance of the possible toleration by the cornea of a foreign body of a more dangerous nature for nearly as long a period of time.

Mr. H., a healthy, middle-aged farmer, resident in Washington County in this State, approached the writer in December, 1881, on a railway train, with the request that he remove a troublesome cinder from the locomotive that had just lodged beneath the upper lid of the right eye. In the act of eversion an opacity was observed in the lower segment of the cornea, on a line with the pupillary margin. After brushing off the cinder a closer examination determined the presence of a foreign substance, and on inquiry concerning its history it was ascertained that it was the result of the explosion of a percussion-cap on the tube of an old-fashioned cavalry pistol in the close vicinity of the eye twenty months previously. Although the fragment was completely embedded in the corneal layers, and there was no evidence from the past history, or from an objective examination, of any irritation having been present, the probabilities of its occurrence were pointed out, and Mr. H. requested me to remove the foreign body. This was done the same day by making an incision with a narrow cataract knife along the course of the spiculum, which was lifted out with an ordinary spud. The bit of copper, which

was surrounded by gray tissue, proved bright and clear under the lens. Its length was 1 *mm.* Prior to removal, $V=\frac{1}{8}$. A slight reaction followed the removal, presumably from exposure during the homeward journey, but nothing unpleasant resulted. An examination within a few days, June 10, 1882, showed a slight corneal macula. $V=\frac{1}{8}$.

A CASE OF BLINDNESS AFTER FRACTURE OF THE BASE OF THE SKULL.

By F. P. CAPRON, M.D., OF PROVIDENCE, R. I.

E. H., of P., presented himself to me, at the Rhode Island Hospital, on the morning of April 20, 1882, on account of an injury to his left eye, received the evening previous. Until this time patient says he possessed excellent vision in this eye, but that the sight of the right has always been defective. His health up to the time of the injury was very good. On questioning him with reference to the cause of the injury, it was ascertained that, on the evening previous, while in a beer saloon, he became involved in some difficulty with the proprietor, who settled the matter by taking him by the throat with one hand, while with the other he seized a drinking glass, and struck him a severe blow over the left eye. With morning came the revelation to the patient that the sight of the injured eye was very much disturbed, and he immediately sought advice.

On examination the following condition was found: the lids were closed and somewhat swollen, and there was ecchymosis of the lids and surrounding parts. There was some tenderness along the upper margin of the orbit, and also over the situation of the lachrymal bone. On forcibly opening the lids there appeared a little injection of the eyeball, and some chemosis, though slight; cornea was clear, iris normal; pupil small, but reacting to light. Tension normal. On testing vision it was ascertained that the patient was able only to distinguish light from darkness, and no change was made by glasses.

After dilatation of the pupil by atropia an ophthalmoscopic examination, by the indirect method, revealed *a glistening white appearance of the inner three fourths of the optic nerve*, a condition

strikingly different from the nerve of the right eye. The vessels were little if any changed from the normal, and no hemorrhages or changes of any other kind were observed in the fundus.

The patient complained of some pain at the back of the eyeball, and stated that he occasionally blew out clots of blood from his left nostril. The case was diagnosticated as one of fracture of the wall of the optic canal, with crushing of the optic nerve. Cold compresses were kept on the eye for a few days, and the swelling of the lids and injection of the ball rapidly diminished. After a day or two a severe pain was experienced in the head, which the patient said seemed to originate behind the eyeball, and thence to extend to the opposite side of the head. During these attacks of pain the patient trembled violently, and he was left in an almost prostrate condition. Iod. potass. in moderate doses was administered, *ter die*, the patient being seen every two or three days.

His condition at present, between six and seven weeks since the injury, is as follows: lids of normal appearance; conjunctiva, cornea, and iris normal; pupil reacting to light. Optic nerve and fundus as when first seen. Field of vision very much diminished in every direction. Tn. $V = \frac{1}{8}$. Patient says, on directing his eye toward a bright light he sees what appears to be a "large ground-glass globe." The pain has diminished in intensity and in the frequency of its occurrence, and now comes on but twice a day, usually, instead of a number of times, as at first, and its direction is now changed, and the patient describes it in his own language as like "two branching horns" extending upward, outward, and backward. He thinks the iod. potass. helps him wonderfully, and has continued it faithfully. The hemorrhage from the nose ceased about two weeks since. There is slight tenderness over the lachrymal bone, and pain on pressing the eyeball back into the orbit. Patient's appetite continues good, but he has lost in weight from 166 to 145 lbs.

Aug. 23. Patient last seen to-day; condition unchanged, with the exception of the attacks of pain being somewhat less frequent and intense.

The right eye, which has always been considered deficient in visual power, has now so improved that with a weak convex glass $V = \frac{3}{8}$.

The above case is, in most respects, very similar to other

published cases, especially to the one reported by Dr. G. Mayerhausen, of Schweidnitz, in the February number of Hirschberg's *Centralblatt*; but it differs from some of the cases, in at least one important particular, and that is the discovery of an apparently atrophic nerve in an eye that was perfectly normal less than twenty-four hours before. This fact, and that of the subsequently unchanged condition of nerve, fundus, and vision, seem to be of sufficient interest to warrant a publication of the case.

A COMPOUND DERMOID CYST OF THE ORBIT.

By HENRY G. CORNWELL, M.D., OF COLUMBUS, O.

Miss C., æt. 33, residing in a northeastern county of this State, consulted the writer, Nov. 12, 1880. The history of the eye disease from which she was suffering I take from a note kindly furnished by her physician, who has been for some years a close observer of the case :

“ At the age of sixteen a slight fulness in the upper and inner angle of the orbit was noticed, which continued to increase slowly in size, so that three years later there was a noticeable protrusion of the globe of the eye in a downward and outward direction. In 1871, six years from the time the swelling first exhibited itself, the conjunctiva of the globe and lids was often inflamed, and the overflow of the tears was quite troublesome. Nothing but domestic remedies was used. In October, 1872, went to Cleveland. Abscess of lachrymal gland diagnosed ; a puncture was made beneath the lid, and this kept open about eleven weeks. In Feb., 1874, she returned to Cleveland. Part of the lachrymal gland in an atrophied condition was removed. In Sept., 1876, consulted Prof. S. D. Gross, whose diagnosis was guarded. In the spring of 1877 there was severe pain in and about the eyeball. An abscess pointed and discharged its contents through the upper lid in the region of the lachrymal gland, being aided by the use of the bistoury. This was kept discharging during the summer until August. The pus was very much like prune-juice in color, but a little thicker in consistency. The probe seemed to impinge upon denuded bone. The pus at no time was offensive. After a few weeks it changed to a yellowish cast ; more often was cream-colored. From Aug., 1877, until you saw the case, there was no discharge. For some months before you saw her she had head-

ache, circumorbital pain, and pain in the globe, together with opacity of the cornea and some chemosis."

At the time the lady first consulted me the following conditions were observed :

Globe of the eye projecting from the orbit in a downward and outward direction. A large oval swelling having regular outlines and smooth surface in the upper and inner angle of the orbit. The eyeball inflamed, with slight pannus and serous chemosis. Pain in and about the eye, photophobia, lachrymation, etc. This condition was due to a want of protection of the eyeball from the air, dust, etc., by the lids, which could not be closed more completely than to cover the margins of the cornea, on account of the exophthalmus. The swelling above the globe was soft and compressible, evidently having its origin deep in the orbit. The history of its slow development, together with its appearance at this time, led me to regard it as a cyst ; and since the eyeball was inflamed, and the patient suffering from circumorbital pain and headache, and her health impaired, I advised an operation for her relief : this to be the removal of the growth, together with an effort to save the globe if possible. To this the patient gave consent, even to the removal of the eyeball, and the operation was done March 19, 1881, in Youngstown, O., with the assistance of several physicians of that city, in the following manner :

The ocular conjunctiva was detached from the inner half of the margin of the cornea, the wound enlarged with the scissors, and the surrounding tissues, by means of the handle of a scalpel, separated into the depths of the orbit. In order to facilitate these latter manipulations, a thread was passed through a part of the conjunctiva which was left attached to the globe, and the eyeball by this means drawn out of the orbit and held by an assistant. Perhaps an inch and a half from the orbital margin of the frontal bone the instrument came in contact with the wall of a cyst, which, through efforts to enlarge the opening in the orbit leading to it, was torn, and a part of its contents evacuated. The perforation was enlarged by means of a scalpel, and the remaining quantity carefully pressed out, and as much of the sac-wall as could be taken up by the forceps was afterward removed with the scissors. The material discharged from the tumor almost filled a dessert-spoon, was of a brownish-black color, of the consistence of corn-meal mush, with rather offensive odor, and made up chiefly of epithelium and fat. The orbital wound was then carefully

cleansed with warm carbolized water, and the globe permitted to return to its place, and the edges of the conjunctival wound united by means of sutures. The eyeball still turned outward, due to the lengthened condition of the internal rectus as a result of the stretching it had undergone, and to correct this divergence a tenotomy of the externus was done. This permitted the globe to assume its normal position so far within the orbit that the cornea was completely covered by the lids. The patient was directed to remain in bed, and cloths dipped in ice-water applied to the eye for twenty-four hours. On the third day after the operation evidences of orbital cellulitis were exhibited in swelling of the lids, pain around the orbit, a return of the exophthalmus now in the direction of the axis of the orbit, chemosis of the ocular conjunctiva, etc. Cold applications were made and other active antiphlogistic means were adopted, but in spite of these, three days later the cornea became cloudy at its periphery, and the inflammatory infiltration of the membrane progressed without retardation from any treatment followed, until it became entirely opaque. Panophthalmitis being inevitable, I decided to remove the globe, believing that the activity of the inflammation in the orbit would not be so great following its removal as if it were permitted to be destroyed by the inflammatory process already begun. This was done March 30th, the patient under ether. After staunching the profuse hemorrhage attending the operation, to my surprise a second sac exhibited itself, its location being above and to the upper and inner side of the severed end of the optic nerve. After an incision into what proved to be a very thick wall, about half a teaspoonful of a substance of the same character as the first sac contained was expressed after the same manner as in the first instance, and a part of the imperfectly defined cyst-wall was excised. My finger in the orbit failed to detect any thing foreign to this cavity. The cellular tissue was much denser than usual, as a result of the several attacks of inflammation which had taken place. No evidence of suppurative destruction of a part of the lachrymal gland was exhibited; the pus discharged from a point at the upper and outer angle of the orbit when the patient was in Cleveland, evidently had its origin from the depths of the orbit in the neighborhood of the cyst. After the removal of the globe and the evacuation of the second cyst, the inflammation in the orbit immediately subsided. A week later, while examining the cavity, an oval mass, soft to the touch, was observed in the

upper and inner angle of the orbit. The patient was anæsthetized, and a small incision through the thick wall of a third sac gave exit to material of the same character as was evacuated in the two former instances. After enlarging the incision, about a third of a teaspoonful was pressed out, and a part of the sac-wall removed with forceps and scissors; this cavity was carefully syringed out with a weak solution of chloride of zinc, and in a few days the patient returned to her home. During the succeeding summer, while in Germany, I received a letter from the doctor informing me that an abscess had formed in the orbital tissues, and that the pus had burrowed a passage along the roof of the orbit, and perforated the upper lid. On examining the case a few months ago, in one or two points the cellular tissue of the orbit was observed to be indurated, but nothing of a cyst character was discovered. The lid was drawn upward, and adherent to a point on the orbital margin of the frontal bone; an opening also existed through which a small quantity of pus was at times discharged; the course of the fistula was not accurately determined for want of time, and on account of the pain attending the probing, and the patient expressed a desire to visit Columbus for a more careful examination at a later date. This has not thus far been convenient. I reasoned at this time, that the remains of the thickened cyst-wall had subsequently excited a cellulitis; the inflammation extending to the periosteum and bone, giving rise to caries, of which the discharge, and retraction and adhesion of the lid are chief indications.

Dermoid cysts are situated, as a rule, deep in the orbit. In fifty-one of the seventy-three cases collected by Berlin,¹ the situation of the sac was: in 27 (53%), on the nasal side; in 12 (24%), on the temporal side; 8 (15%), below; and 4 (7%), above. In my own case, it will be remembered the cyst was above, the largest of the three sacs toward the temporal side of the orbit.

The point of development of the sac is probably in the anterior part of the orbit, the sac projecting itself deeper into the orbital cavity (Berlin). It is located external to the ocular muscles, but, according to Mackenzie (ed. 1855, p. 326), it insinuates itself between them, and through the inflammation it excites contracts adhesions with the globe,

¹ *Graefe-Saemisch*, Bd. vi, S. 678.

the muscles, the optic nerve, periosteum, etc. He notes (*l. c.*) that they are sometimes found within the ocular capsule, but this is probably an error. They are, as a rule, unilocular, but cases exhibiting several sacs are recorded by Barnes,¹ St. Yves,² Szokalsky,³ and Schiess-Gemuseus.⁴ They slowly enlarge so as to, in some instances, attain enormous size.

Rosas reports a case in which the sac grew to the size of a goose-egg.⁵ In Ingram's case the sac contained a wine-glassful of fluid. They have not been known to penetrate the cranial cavity. Delpech's case, recorded by Mackenzie (*l. c.*, p. 329) as a cyst projected into the brain, where, after tapping, death followed, was undoubtedly an encephalocele. They sometimes degenerate into malignant disease, according to Mackenzie, who records an illustrative case (*l. c.*, p. 327).

While solid tumors within the orbit, as a rule, whether malignant or non-malignant, after they have attained large size, cause carious destruction of its walls, this condition does not appear to apply to encysted tumors, for beyond some dilatation of the cavity nothing further has been observed. In general it may be said that such growths cause less exophthalmus than solid tumors, as they seem to accommodate themselves to the cavity which contains them. They gradually enlarge, and if left to themselves may cause death through meningitis, etc.

The direction of the exophthalmus manifestly varies with the location of the cyst. The sac-wall is in some cases very thick; in others, almost translucent. The character of the contents of these sacs varies greatly. It may be almost pure oil ("oil-cysts") as in the cases of Verneuil,⁶ Hirschberg,⁷ Berger,⁸ Bull,⁹ and others. In 37 of the 73 cases col-

¹ *Medico-Chirurgical Transactions*, vol. iv, p. 316.

² *Medico-Chirurgical Transactions*, vol. iv.

³ *All. Wiener med. Zeitung*, 1860.

⁴ *Arch. f. Ophth.*, xiv, 1, p. 73, 1868.

⁵ *Oestr. med. Wochenschr.*, 1841-2.

⁶ *Trans. Soc. de Chirurgie*, 1876, p. 1206.

⁷ These ARCHIVES, viii, No. 3, p. 372.

⁸ Kyste huileux de l'orbite. *Bull. de la Soc. Chir.*, No. 9.

⁹ *Amer. Journ. Med. Sc.*, Jan., 1878.

lected by Berlin (*l. c.*), in 19 there were found epithelium and fat ; in 9, viscid, honey-like fluid ; in 6, hair [Kerst, Ammon, Lasserre, Szokalsky, Watson (2 cases)] ; in 2, chalky concretions [St. Yves, Cunier] ; in 1 case a tooth was discovered (Barnes, *Medico-Chirurgical Transactions*, vol. iv, p. 316).

In 45 cases the time of life at which the cysts were developed was (Berlin):

In 8 (18%), the patients were 20 years old and over.

In 37 (82%), the patients were under 20 years. Of the 37 cases :

In 16 (35%), the patients were between 10 and 12 years.

In 17 (38%), the patients were affected at birth.

Concerning the etiology of encysted orbital tumors of the variety just considered, the writer has no opinion to offer. The theory seems to be pretty well established in the minds of ophthalmologists generally, that they are formed by an invagination or involution of the external blastodermic membrane during foetal development. Of the 73 cases collected by Berlin, all but 23 were unmistakably, judging from the character of their contents, dermoid cysts. The fact that so large a number of cases were congenital, the others developing at an early period in life—only 8 of 45 cases exhibiting such a condition after 20 years of age,—is one of much importance in favor of such a theory. Wecker differs from this opinion concerning their etiology, and regards them as retention cysts, due to an obstruction (pre-natal) of the follicles of the lid. But against this theory there is the fact, as Berlin has shown after a careful study of the literature of the cases on record, that in no case was any direct or indirect connection between the sac and lids discovered ; moreover, the character of the contents of the sacs—oil and epithelium, bunches of hair, teeth, etc., *i. e.*, dermoid productions—weighs heavily in favor of the first theory. Of the 23 doubtful cases (doubtful because their contents differed from those of all the others in being thin and watery or synovia-like) according to Berlin, they can be better regarded as dermoid cysts than that they are extra-cranial encephaloceles (of which there is but one example on record), or cysts formed (according to Butterlin and others) from enlargement of the orbital bursæ.

ON THE MATURITY OF CATARACT, ITS ARTIFICIAL RIPENING, CORELYSIS, AND EXTRACTION OF THE ANTERIOR CAPSULE.

BY PROF. R. FÖRSTER, M.D., UNIVERSITY OF Breslau.

Translated by J. A. SPALDING, M.D., Portland, Me.

I.—*Maturity of cataract.*

IT is generally easy to tell with absolute certainty whether a cataract is perfectly mature or not. Still, there are some cases in which this point is difficult to decide, from the insufficiency of the well-known criteria for the maturity of cataract, viz., that the iris should not cast a shadow against the lens, and that the pupil, artificially dilated by atropia, should not be illuminable with the ophthalmoscope.

There are cataracts which have been mature for years, in which the iris, however, still throws a shadow, and the dilated pupil is more or less illuminable by the ophthalmoscope ; while, on the contrary, there are cases of immature cataract in which the iris does not throw a shadow on the lens, nor does the dilated pupil give the slightest red reflex from the fundus of the eye when illuminated with the ophthalmoscope.

In order to avoid misunderstandings, we must first agree upon what is meant by a "mature" cataract. As v. Arlt says of mature cataract, "the lens lies in the capsule like a ripe fruit." Hence, by "ripe" or "mature" cataract we might as well agree to understand one whose whole substance *can* be evacuated by the operation, without the necessity of any portion of the peripheral layers being left behind by adhering to the capsule.

It is also, of course, quite possible for portions of the lens to remain in the eye after extraction of the cataract, even if it were mature, as, for example, happens when we cannot perfectly accomplish the last step of the operation (the cleansing of the area of the pupil), owing to too small a section and the fact that superficial layers of the nucleus are rubbed off during the exit of the lens from the eye, or when owing to the unruly behavior of the patient, or to too deep-set position of the eye, or from hemorrhage into the anterior chamber, or from loss of vitreous, etc., the last fragment of the cataract cannot be wholly removed. Even when cataracts are undoubtedly hypermature, fragments of the cortex may crumble off and be left in the eye; they may, indeed, be pushed to and fro, but their consistence prevents them from being moved along into the opening made by the incision, and they generally fall into the fold of the capsule.

Anatomical examinations would seem to prove that after every cataract extraction portions of the cortex are left behind in the capsular fold. But in all these cases the fragments of cortex float about loosely in the capsule, or outside it in the anterior chamber, and *are consequently not subjected to a subsequent process of opacification and swelling.*

On the contrary, however, in the case of *immature cataract*, and even under the most favorable circumstances, fragments of the cortex may also remain after the exit of the nucleus, either from the fact that their transparency prevents them from being seen by the operator, or from close adhesion to the capsule, so that, despite repeated rubbing of the cornea with the eyelid or spoon, they will not move from their position in the centre of the pupil, and soon become wholly opaque and swollen. When the pupil appears black after the operation, or, at most, reveals but a few thin fragments of cortex that cannot be pushed aside or removed, and then on the next or following days is blocked up by gray masses, I am convinced that this occurrence has arisen from opacification and swelling of those transparent portions of the cortex (according to Becker, from the posterior cortex) which were left in the area of the pupil. Some

operators have endeavored to explain this subsequent blocking up of the pupil by claiming that the cortical masses which were left in the capsular fold had been in some way pressed toward the axial portion of the capsular sac.

I will not, of course, deny the possibility of such a change in the position of the cortical fragments, but I think that the blocking up of the pupil is by far most frequently and simply due to secondary opacification of the transparent central portions of the cortex which remained in the eye after the operation. This view appears all the more justifiable, because an accurate examination of the cataract before the operation and observation of the behavior of those portions of the cortex which cannot be removed, permit us to predict with certainty whether the pupil will be clear in the following days, or covered with a grayish cloud.

A *mature* cataract, consequently, is one in which we can positively assert before the operation that there are no longer any cortical layers which will adhere to the capsule and undergo secondary opacification—even if the pupil can still be illuminated and the iris still throws a shadow. An *immature* cataract is one of a consistency which experience teaches us is liable to be accompanied with a layer of cortex adhering closely to the capsule—even if the pupil cannot be illuminated and the iris throws no shadow.

In this sense of the word "*maturity*," we shall include:

1. The great majority of cataracts in which there can be no doubt (for the two tests above mentioned concur in proving maturity), and in which there are no sectors which shine like mother-of-pearl. Such cataracts are white, yellow, or yellowish-gray. The whiter they are, the thicker the cortical substance.

2. Those cataracts with a very large *brownish-yellow* nucleus, which completely fills the capsular envelope, and with no cortex at all, or only a very thin layer, at least in the area of the enlarged pupil (phacoscleroma). *The pupil is generally more or less illuminable, and the iris throws a distinct shadow.* Even after years the nucleus never gets so dark as the cortex. Oblique light and the shadow penetrate deeply into the nucleus, which is about as transparent

as brownish or yellowish ammoniac soap, while the cortex resembles whitish soda soap. The occasional absence of the shadow and the impossibility of illuminating the pupil are simply due to the opacity of the cortical layers. But even in these pure nuclear cataracts, we can see by extreme lateral inspection and oblique illumination, that the opaque lenticular substance extends to the limit of the capsule, but the mother-of-pearl reflection upon the anterior surface is entirely absent.

Cataracts of this sort, although undoubtedly mature, allow of a considerable amount of vision; fingers can be counted at 2 *m.*, or even further. It may indeed occasionally happen, that we can still distinguish the optic papilla by means of the ophthalmoscope, and that the patient can decipher ordinary print if he holds it very close to the eye, and uses a strong convex glass. The only alteration that these cataracts undergo is that in the course of years the nucleus grows darker and darker brown. I once knew an old man who had had such mature cataracts for fifteen years, but as he could always easily find his way about alone, he would never consent to an operation.

3. Certain cataracts of very slow development, with bright yellow or whitish and relatively small nuclei, and a thick layer of semi-transparent cortex (Becker's nuclear cataract: *Graefe-Saemisch*, Band v, pag. 269). When in the course of years *a thin subcapsular layer has finally grown opaque* (as we can easily discover by focal illumination and lateral examination), the iris still shows an intense shadow into the extremely transparent cortical layer. If we make a preliminary iridectomy, and dilate the pupil with atropia, we can easily distinguish the borders of the small white nucleus in the area of the coloboma, while the cortical layer at the side of the border of the nucleus is transparent. The anterior surface is not divided off into sectors, nor does it glitter like mother-of-pearl. In this stage, these cataracts escape from the capsule without leaving any cortical fragments.¹

¹ Of course, I do not assert that an intermediate layer of cortex remains permanently transparent in all cases of Becker's nuclear cataract.

Amongst *immature* cataracts are to be included, despite the absence of the shadow from the iris and the impossibility of illuminating the pupil, those in which the opaque cortical substance is divided off into well-marked sectors of a mother-of-pearl or tendinous glitter. Inasmuch as all the sectors do not shine alike, with equal illumination, the glitter in the different sectors varies with the alteration in the angle of incidence, so that the anterior surface of the lens appears faceted. If the division into sectors is sharply defined, or only discovered at an early stage of its development, and, moreover, if transparent portions of lenticular substance are discovered in close proximity to those opaque portions which lie close behind the capsule, we can confidently anticipate that some thin flakes of cortex will not be expelled through the incision, even if we rub the cornea with the eyelids or spoon; they will always slip back into the eye the transparent lenticular substance holding them firmly to the capsule. On the next or following days, however, the area of the pupil is almost filled with opaque lenticular substance. The anterior or posterior cortex may have been the one to adhere to the capsule, but it is worthy of notice that the posterior surface of the nucleus is generally covered with a much thinner layer of cortex than the anterior.

I have repeatedly examined eyes in which the same cataract appeared at the posterior pole of an amber yellow tinge, surrounded by a white ring (opaque cortex), while on the anterior surface it was white. The posterior surface of the nucleus evidently extended to the capsule, while in front it was covered by a thick layer of cortex. The cortical layer is always thickest at the equator of the lens, thinnest at the posterior surface.

We can declare with confidence that when the anterior surface of a cataract is divided off into sectors which shine like mother-of-pearl, the cataract is not yet mature. If we wait a few months for the operation, the sectors lose their sharp contours, break down, begin to grow invisible, and finally disappear entirely. Complete maturity in the above-mentioned sense has now ensued, and we can depend upon a favorable exit of the whole cataract. At a still later stage,

the yellow nucleus which had hitherto been remarkably well concealed, becomes somewhat more marked in color, the cortex appears thinner, as if dessicated upon the nucleus, and provided with a few whitish radiating lines—in a word, the cataract is becoming hypermature.

II.—*Artificial ripening of cataract by trituration of the cortex.*

The painful period for patients afflicted with cataracts is that which lies between the day when they can no longer read, and the time when the cataract becomes mature. This interval may extend over several years, but fortunately it is often rendered much more endurable by the circumstance that the two eyes are not generally affected in an equal degree at the same time. But when a cataract makes the head of the family incapable of work for year after year, the occurrence becomes a family affliction. The patient thinks that he ought to be operated upon the moment that the cataract incapacitates him for work, whilst the surgeon feels obliged to wait till the favorable moment, the maturity of the cataract, has at last arrived. Desirous as the surgeon is to do every thing that is compatible with safety, he is often inclined, in such cases, to seek experimentally for some operation which may hasten the cataract toward complete maturity.

It is well known that puncture (incision) of the anterior capsule has long been resorted to, to produce rapid artificial maturity in cataracts. But the method has not been universally adopted, from the dread that it might set up iritis from excessive swelling of the cataract, and lead to complications unfavorable for the subsequent extraction. Personally, I have never seen iritis or cyclitis after puncture of the capsule in cases of *senile* cataract, while on the contrary I have often been greatly surprised at the comparatively slight and rather unsatisfactory effect of the capsular incision in hastening the opacification of a lens with a large nucleus more or less advanced in cataractous degeneration. We can make an incision 3 or 4 *mm.* long in the capsule of such cataracts without causing extensive opacity of the

cortex. The only effect is the presence, a few days later, of a small flake of cortex pressing forward into the anterior chamber, while a really hard nucleus does not seem to undergo any swelling at all or resorption from contact with the aqueous humor. I have seen many and many a nucleus lying in the anterior chamber of eyes in which the operation of reclinatio had been performed fifteen or twenty years before. These nuclei had subsequently slid forward from the vitreous body into the anterior chamber, measured 4-5 *mm.* in diameter, and lay there month after month without undergoing any visible alteration. Many similar instances of nuclei lying for years in the vitreous chamber also, without undergoing resorption, are recorded in *Graefe-Saemisch* (Band v, pag. 329).

For five years I have resorted to a process (well worthy of recommendation in suitable cases) in order to hasten the maturity of slowly ripening cataracts, especially Becker's nuclear cataracts (see, *antea*, page 347). It likewise happened to me, as it did to Snellen (*Graefe-Saemisch*, Band v, Pag. 361), to observe that an iridectomy occasionally hastens the maturity of cataracts.

CASE.—Mr. H., æt. 45.

January, 1873.—Has incipient cataract in his left eye; a further advanced cataract in his right eye. The left eye only is still capable of work.

Sept., 1874.—This eye has lost its useful vision.

Both lenses have yellowish-white nuclei, while the cortex is only partially opaque, and several years will undoubtedly pass ere the cataracts reach maturity. The patient was urgent for an operation, to prevent his being put on the retired list. I intended to make an incision in the capsule, but as the cortical layer was very thick I dreaded the advent of excessive swelling of the lens after making the incision, and contented myself with performing an iridectomy in each eye.

Oct. 1, 1874.—To my surprise both lenses became so opaque directly after the operation that the incision in the capsule was postponed, and in the short period of five weeks after the iridectomy the cataract in the right eye was extracted as mature. The cataract in the left eye also had already undergone complete

opacification during this short period, but the sectors upon the anterior surface were still sharply defined. Five months later the sectors had disappeared, and extraction was performed. Both operations were normal, the cortex came entirely away, and the recovery left nothing to be desired.

We may assume under such circumstances that, owing to the alteration in form to which the lens is subjected by being pushed forward after the escape of the aqueous humor, the connection between the opaque and transparent fibres of the cataract is loosened, and the degeneration of the cortical layers hastened. We may undoubtedly further this condition of things directly after the iridectomy by *gently* rubbing or stroking the cornea with the blunt angle of a strabismus hook or the closed iris forceps. It is astonishing to see the effect which is produced upon the lenticular substance by pressing gently upon a cornea which has thus been temporarily deprived of its normal tension. If mother-of-pearl sectors were already present on the anterior surface of the lens, we immediately notice how they break up and intermingle with one another after this manipulation. But even if the sectors had not previously made their appearance, the crushing effect upon the cortex, as thus produced, is easily recognizable by the increased opacification which takes place in the layers which were still transparent, even within the space of only a few days. I have known cataracts that were illuminable before the operation, to become so opaque six days later, as entirely to cut off the red reflex from the fundus of the eye. The shadow of the iris generally disappears, but not wholly; the white nucleus of Becker's nuclear cataract becomes almost wholly concealed by the opacified cortex. In the same way the senile, yellowish-gray nucleus which had hitherto been visible through the transparent layer of cortex disappears beneath the advancing opacification of the peripheral layers of the lens. Extraction can generally be undertaken in from four to eight weeks after the operation, without the dread of any lenticular fibres adhering to the capsule. It is very rare for us to be obliged to postpone the extraction to a later date.

The only difficulty in this manipulation lies perhaps in an accurate calculation of the pressure to be applied. If the pressure is excessive, the zonula may easily be ruptured, and when we subsequently perform the extraction, unavoidable loss of vitreous and difficult delivery of the lens itself would ensue. I should not think that there was any danger of rupturing the capsule. If, on the contrary, too gentle a pressure is brought to bear, the connection between the lenticular fibres will be too slightly disturbed, and speedy maturity will not occur. But these difficulties are really only imaginary. Whoever can extract a cataract must possess the necessary degree of touch. We must, however, not be so sanguine as to expect that every cataract, no matter how far developed, can be brought rapidly to maturity by kneading the cornea. So-called choroidal cataracts, *e. g.*, in which only a thin cortical layer at the posterior pole is alone opaque, whilst the larger part of the lens remains transparent for a very long period, cannot generally be altered by this procedure. Experience, based upon two hundred and more cases, teaches me that the expected maturity can be most surely awaited in those cases of cataract with a firm and somewhat opaque nucleus, for the cortical substance will then be, as it were, crushed to pieces between the cornea on the one side and the hard nucleus on the other. A further condition of a safe and rapid result is that opacification in the anterior cortex, even if very peripheral, and consequently decay of the cortical fibres, must already have set in. Healthy lenses are not generally rendered opaque by moderate pressure or rubbing upon the cornea (compare Case 3, *postea* page 353).

A few examples may here follow :

CASE 1.—Madame K., æt. 51.

Jan., 1872.—The left eye has small whitish opaque nuclei. Sn No. 8 is scarcely read with + 12. Sight has been gradually diminishing for eight years.

Oct., 1877.—Five and a half years later, left eye, small whitish nucleus surrounded by a thick layer of extremely transparent cortex.

Oct. 15, 1877.—Iridectomy upward, followed by trituration of

the cortex. Seven days later the whitish nucleus can no longer be distinguished; the zone of transparent cortical substance which appeared dark has given way to a whitish opacity.

Jan. 25, 1878.—Peripheral extraction.

Feb. 15th.—Aphakia, pupillary border free, media transparent, optic papilla very distinct.

CASE 2.—Mr. P., æt. 65.

Sept., 1874.—Left eye blind for several years from detachment of the retina; right eye: clumps of floating opacities in the vitreous, grayish-green opacity of nucleus, traces of opacification in the cortex, atrophy of choroid (sclerectasia posterior). Sn No. 3 is decipherable with difficulty. The patient cannot read at all.

March, 1877.—The pupil, when dilated with atropia, gives a red reflex; the optic papilla is still visible, as well as the vitreous opacities. Sn No. 5 with difficulty.

Sept., 1877.—Condition about the same; nucleus dark brown; no cortical opacity.

Sept., 18, 1877.—Iridectomy with trituration of the cortex; ten days later the pupil is no longer illuminable. Jaeger No. 24 can no longer be made out. A white opaque layer of cortex covers the nucleus.

Nov. 6, 1877.—Extraction, with total escape of the lens, and good recovery.

CASE 3.—Mr. F., æt. 67.

May, 1876.—Incipient cataract in both eyes. *Left*, Sn. No. 3 at 4" barely (sclerectasia posterior). *Right* eye still useful.

April 11, 1877.—Left eye: optic papilla recognizable; nucleus moderately opaque; reflex from the posterior capsule still recognizable, but distorted, and surrounded by a vapor halo. The cortex begins to opacify and divide into sectors. The right eye is already useless.

April 18th.—Iridectomy on the left eye, with trituration of the cortex.

April 26th.—Decided increase in opacity. The dilated pupil cannot be illuminated. The anterior cortex is white and glitters like mother-of-pearl.

July 3d.—The anterior surface of the lens still shows the sectors, but extraction is performed despite this condition.

July 20th.—Recovery good; no posterior synechiæ; a few flakes of cortex in the area of the pupil, but the optic papilla is recognizable. Sn No. 3, with $+2\frac{3}{4}$ at 5" to 8".

III.—*Corelysis, and the avoidance of anterior synechiæ.*

Pressure on the flaccid cornea has an equally influential action upon the iris also. After the aqueous humor has flown off, every portion of the pupillary margin can be dislocated far out toward the periphery of the anterior chamber by pressure exerted upon the cornea in various meridional directions. The moment that the instrument is removed from the cornea, the portion of the pupillary margin that has thus been treated returns toward the axis of vision. By successively pressing one portion of the margin of the pupil after another toward its ciliary insertion, we can also successfully break up posterior synechiæ. Narrow, thread-like adhesions can, undoubtedly, be ruptured in this manner, even if very numerous. If the adhesions are broad and ribband-shaped, the process is not generally so successful.

As it is always extremely desirable to free the whole pupillary margin, when we perform an iridectomy in cases of numerous synechiæ, I would suggest that the iridectomy should always be supplemented by this manipulation. In this way I have often succeeded in freeing the whole pupillary margin, even when completely adherent to the lens. Of course we must use atropia energetically, both before and after the operation.

I have never known this procedure to do any harm to the iris or lens, still it should be limited to cases in which all inflammatory reaction upon the part of the iris has disappeared.

We may resort to a similar manipulation also—gentle stroking pressure with a blunt instrument upon the cornea,—in order to avoid an incarceration of the iris in the angles of the incision, which might become permanent after an iridectomy. It is also available in warding off anterior synechiæ.

Although we may acknowledge that it is, in a few cases, impossible to avoid imprisonment of the iris in the angles of the incision—especially in the case of an atrophic and friable iris, loss of vitreous, or extensive hemorrhage into

the anterior chamber by means of which our view of the parts is impeded,—yet in a general way it may be asserted that adhesions of the iris in the cicatrix indicate bad surgery. Still more decidedly can this be said of a subconjunctival prolapse of iris, as is occasionally observed after cataract-extraction by the peripheral linear incision. In order to repair these accidents, we are generally advised to push back into the anterior chamber, with a spatula or probe, the bit of iris which lies in the angle of the incision, or to seize it with the forceps, draw it further out, and cut it off. Both of these procedures deserve, of course, to be carefully considered, and I am far from desiring to reject them. The latter especially is often greatly to be preferred when a large nucleus has in its exit pushed a considerable fold of the iris into an angle of the incision, because it is much better to remove a part of the iris that has undergone excessive pressure than to replace it. By this procedure we of course obtain an extremely large artificial pupil.

In the majority of such cases, however, a few strokes with gentle pressure upon the cornea by means of the knee of the closed iris forceps or with a spoon is almost always sufficient to cause the margin of the pupil to return to its proper position in the eye. This step can be accomplished by placing the knee of the forceps on the angle of the incision in which the iris has been incarcerated, and with gentle pressure slowly passing down across the cornea (if the incision were made in the upper margin of the cornea), in the direction of the middle part of the lower edge of the cornea. By this manœuvre we drag, as it were, the iris back again into the anterior chamber. We must repeat the process until the corners of the sphincter appear in their correct position. The procedure is more efficacious, and probably irritates the incision less than the reposition of the prolapse with the spatula.

IV.—Removal of the anterior capsule in cataract-extractions.

The presence of fragments of the lens in the eye after extraction of cataract has always been regarded as the chief

cause of secondary inflammation. And this is the reason why so many attempts have been made to extract cataracts with the closed capsule (*Graefe-Saemisch*, Band v, pag. 284). Since Pagenstecher and Becker have drawn attention to the fact that the incarceration of tags of capsule in the incision may give rise to inflammation of long duration in the ciliary body, a new demand has arisen for the removal of the capsule also, at the time of the operation. But it is not so much the capsule as a whole, as the fragments of the *anterior* capsule which are to be accused as the noxious cause, for there can be no dread of the incarceration of the posterior capsule in the incision after a normal performance of the operation.

Opacities of the capsule ought to be removed from the eye *before* the escape of the cataract. This can generally be accomplished easily with the forceps. But in so doing we of course seize upon a much larger piece of capsule than that which is opaque, and withdraw it from the eye. Experience of this sort induced me eight years ago in a series of cases to make an experimental opening in transparent capsules also, with toothed forceps, rather than with the cystotome. I soon found the method so advantageous that I resorted to it regularly, and only returned to the cystotome when the forceps left me in the lurch. v. Arlt has also employed this method in a few cases (*Graefe-Saemisch*, iii, 300), and Colsmann, who has had peculiar saw-tooth forceps especially constructed for this purpose, has published a case¹ in which with this instrument he cut a piece 3 *mm.* broad and 5 *mm.* long from the anterior capsule.

As neither of these authors, however, have reported any more cases in their own experience, and as, on the contrary, I have tried a similar method in some hundreds of cases since October, 1874, I think that I may be permitted to speak of the subject somewhat more in detail.

In opening the capsule, I formerly employed Liebreich's iris forceps, with two teeth on the under side of each arm close to the point, but within the last six months I have

¹ Colsmann: Ueber die Entfernung eines zusammenhängenden Stückes aus der vorderen Linsenkapsel. Wiesbaden, 1879.

used a forceps with three teeth on each branch, and find it much more serviceable than Liebreich's.¹

Energetic instillation of atropia precedes the operation for a whole day. The forceps are introduced closed, pushed beyond the centre of the pupil, and then opened as wide as the edges of the pupil will allow, even crowding them somewhat aside. They are then closed, with very gentle pressure of the arms against the anterior capsule. As we complete the closure, we can often see that we have caught up a fold of the capsule which lies enclosed between the teeth of the forceps. On withdrawing the forceps, however, we find a larger bit of capsule than that which corresponded precisely to the space lying between the teeth. It is a very nice plan to drop the bit of capsule into Müller's solution, then to tint it, and finally to spread it out smoothly upon a glass plate. We then see to our surprise that the diameter of the lowermost round or oval bit of capsule measures as much as 6–7 *mm.*, and as the whole capsule measures only 9 *mm.*, we have evidently in such cases removed the greater part of the capsule, so that only a narrow rim remains. It may well be supposed that in this way fragments of the capsule will not so frequently become incarcerated in the incision.

The fact that the bit of capsule thus removed is almost always larger than that which lies between the teeth of the forceps, certainly indicates that toward the equator of the lens the capsule offers less resistance—tears more easily—than in the neighborhood of the anterior pole, a condition which can be explained by the capsule being *twice* as thick at the anterior pole as at the equator. According to Ritter,² the capsule is 0.007 *mm.* thick at the equator, and 0.016 *mm.* at the anterior pole.³

¹ These forceps can be had at Brade, instrument-maker's in Breslau, Hummeri, 31, at the price of 4 marks.

² Wecker: "Maladies des yeux," Paris, 1868, tom. ii, page 3: "At a short distance from the equator of the lens and a little to this side of the origin of the zonula, the capsule increases quite sensibly in thickness," etc. The figures 0.16 *mm.* are a printer's error, and should be 0.016 *mm.*

³ The slight thickness of the periphery of the anterior capsule also explains another disagreeable accident which sometimes occurs in splitting secondary cataracts. When we have in view to divide with a needle a secondary cataract that is somewhat thicker than usual, it often happens that the cataract does not

Another great advantage of removing the larger part of the anterior capsule lies in the fact that the cortex escapes more perfectly and completely, since none of it can be left behind by adhering to the anterior capsule. I would here remark, by way of parenthesis, that some lenticular substance is always discovered clinging to the capsule, when the latter has been removed in the way suggested above.

I have succeeded in seizing a fold of the capsule with these forceps, in 88 out of 100 cases. In 85 simply a piece of the capsule was thus removed; in three, the whole lens with its capsule followed the traction. In twelve further cases the forceps slipped, as most frequently happens, in my opinion, from an abundance of cortex or a greatly swollen condition of the lens. Perhaps this large percentage of cases in which the forceps slipped might be reduced, by taking care that the teeth of the forceps were very sharp. If we cannot rupture the capsule by grasping it once or twice, I would advise the use of the cystotome, rather than to exert too great force with the forceps. I have not had any greater percentage of loss of vitreous by this method than when I simply used the cystotome.

The best method of clearing away the capsule after exit of the lens, is to push the fine, straight, toothed forceps between the lips of the incision, and by repeatedly opening and closing them to endeavor, in the whole length of the incision, to catch the fragments of the capsule. We can thus frequently grasp them, especially when the capsule has been opened with the cystotome. I then make gentle traction, helping myself, if occasion demands, with a second pair of forceps. I think that it is not only unnecessary but even injurious to cut off these capsular fragments as has been recommended by some operators, for the fragments are then much more liable to become incarcerated in the incision. I have no fear of prolapse of vitreous during this

tear at the spot, or solely at the spot which has been directly attacked with the needle, but at a district in the capsule which lies further behind the iris, and consequently toward the periphery of the capsule. Our aim, therefore, of making a strictly central opening in the capsule partially miscarries. I have consequently abandoned the use of the cataract needle for years in all operations on simple secondary cataracts, and used v. Graefe's cataract knife, with which we can make a more extensive drawing incision than with a needle, the blade of which is too short for this purpose, and tears a hole rather than cuts one.

manipulation, for I have previously withdrawn the elevator and removed the fixation forceps.

Although the statistics to illustrate the advantages of this method by the percentage of recoveries will gain greater significance by future accumulation of cases, and after a longer series of years, yet I feel as if I ought to cite this fact, that in a successive series of 100 cases of uncomplicated senile cataract, operated by the above-mentioned plan, I have obtained a perfect recovery in 89, with a perfectly free pupil—without a single posterior synechia.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE FIRST QUARTER OF THE YEAR 1882.

By H. MAGNUS, Breslau ; C. HORSTMANN, Berlin ; AND
A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

E. NETTLESHIP, London ; C. E. FITZGERALD, Dublin ; E. MARCKWORT
and P. VON MITTELSTÄDT, Antwerp ; DANTONE, Rome ; VAN DER LAAN,
Lisbon ; HIRSCHMANN, Charkow ; S. M. BURNETT, Washington ; OLE
BULL and SCHIÖTZ, Christiania.

Translated by Dr. F. E. D'OENCH, New York.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE ;
GENERAL PATHOLOGY, DIAGNOSIS, AND THERA-
PEUTICS ; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL,
AND HISTORICAL SUBJECTS.

1. Atti dell' associazione ottalmologica italiana. Sessione di Roma, 26-30
Sett., 1881. *Ann. d' ottalm.*, vol. x, 6. The society, though founded in July,
1869, began to flourish only lately ; it now has 40 members, and meets annually
in September in an Italian university-city ; Padua was chosen this year, and
Prof. Gradenigo, president.

2. DREHER. The effects of light. *Studenten-Zeitung*, 1882, Nos. 9 and
10. The vibrations of the ether cannot produce the conceptions of heat and
light by at one time striking the skin and at another the eye ; the line between
rays of heat and light must be strictly drawn. In the solar spectrum there are
three kinds of rays : rays of light, heat, and chemical rays, to which as a fourth
kind the magnetic rays might be added. The light of fluorescent substances is

not due to the light illuminating them, but is a transmutation of the chemical rays contained in the light into rays of light.

3. EVERSBUCH. The most important contributions to the comparative anatomy of the eye. *Zeitschr. f. vergl. Augenheilk.*, 1882, vol. i.

4. GIRARD. Les cécités soudaines. *Rev. d' ocul. du sud-ouest*, vol. iii.

5. GUAITA. La microfotografia applicata all' anatomia patologica. *Ann. d' ottalm.*, vol. x, 6. A Hartnack microscope is provided with a camera obscura, into one end of which a prepared plate can be inserted. In order to obtain pictures of moderate size, either the ordinary lens of the photographic apparatus, or one of the object-glasses of the microscope is used; to obtain still larger pictures the eye-pieces of the microscope are also added. The samples of sections in retinitis pigmentosa are very good. DANTONE.

6. MENGIN. Observations cliniques. *Rec. d' ophth.*, 1882, No. 1. 1. Injury of the eye. 2. Foreign body in the eye. 3. Compound myopic astigmatism with monocular diplopia.

7. STELLWAG VON CARION. Papers on practical ophthalmology; supplement to the text-book; in conjunction with Prof. Wedl and Dr. Hampel, Vienna, 1882. 1. Some terms used in ophthalmology and their clinical meaning. 2. The pathological anatomy of glaucoma, by Prof. Wedl. 3. Increased tension and glaucoma. 4. Embolism of the central retinal artery. 5. Central power of vision. 6. The power of accommodation and its influence on the choice of glasses. 7. The connection between the power of accommodation and strabismus. 8. The diagnosis of paralysis of the muscles of the eye.

8. STREATFEILD. Observations on some congenital diseases of the eye. *Lancet*, 1882, Feb. 18 and 25, No. 3052.

b.—STATISTICAL PAPERS.

9. ALEXANDER. Third report of the ophthalmic institute of the district of Aachen. Aachen, 1882. New patients 2009; 299 operations: 11 extractions of senile cataract, 31 iridectomies, 11 operations on the muscles—3 of detachment of the retina.

10. WHITE. First annual report of the Richmond Eye, Ear, and Throat Hospital, for 1881. 418 eye-patients; 116 operations: among them 23 extractions, 16 iridectomies, 8 enucleations, 9 tenotomies. BURNETT.

11. Fifty-sixth annual report of the Massachusetts Charitable Eye and Ear Infirmary, for the year 1881. Boston, 1882. With an illustration and plan of the institution; 7471 eye-patients; 815 operations: 102 operations on the lens—among them 72 extractions of senile cataract after Graefe, 13 by suction—20 iridectomies, 42 enucleations, 90 operations on the muscles. The 72 extractions are reported by Derby in a careful statistical paper: in 85 per cent. a good result was obtained; 2.7 per cent. were total failures.

12. GÜTERBOCK. The sanitary condition of the engineers of the Berlin and Anhalt R. R. *Deutsche Vierteljahrsschrift für öffentl. Gesundheitspflege*, 1882, vol. iv, 1. Among 180 persons 10, —5.5 per cent., had $V < 1$; one had a senile cataract; 1, conjunctivitis; 1, detachment of the retina; 1, maculæ corneæ.

13. JANY. Seventeenth annual report of Dr. Jany's ophthalmic institute at

Breslau, 1881. Breslau, 1882. 3562 patients; 118 operations on the lens: among them 50 extractions for senile cataract with perfect result in 94 per cent., imperfect result in 4 per cent., and total loss in 2 per cent.; 72 iridectomies, among them 9 for glaucoma; 8 sclerotomies in glaucoma, 20 enucleations, 17 squint-operations.

14. Thirtieth annual report of the Silesian Society for the relief of poor eye-patients, for the year 1881. Very brief report. 3817 patients; 72 extractions of senile cataract; 48 iridectomies, among them 26 for glaucoma; 22 squint-operations.

15. KERSHBAUMER. Fourth report of the Salzburg Ophthalmic Institute, for the year 1881, and a third, fourth, and fifth hundred of cataract-operations. Salzburg, 1882. 2056 new patients; 89 extractions according to Graefe: in 87 cases perfect result, 1 imperfect result, 1 failure; 77 iridectomies; 30 of them for glaucoma; 1 sclerotomy; 25 operations on the muscles. The report of the cataract-operations will appear later.

16. Newark Charitable Eye and Ear Infirmary. Second annual report, for 1881. Newark, 1882. Statistics missing.

17. PFLÜGER. Ophthalmic clinic of the University of Berne. Report for the year 1880. Berne, 1882. 1640 eyes were treated; the number of patients is not given. 189 more important operations: 12 extractions according to Graefe, 11 successful, 1 failure; 54 iridectomies, 16 of them for glaucoma; 15 operations on the muscles.

18. REYNOLDS. Cataract-extraction. *Med. Herald*, 1882, Feb. Report on 222 extractions, with a loss of 4 eyes. Broad sclero-corneal section, extensive iridectomy and peripheral capsulotomy. BURNETT.

19. SCHÖLER. Annual report of the ophthalmic clinic for the year 1881. Berlin, 1882. 4326 new patients, 339 operations, 52 extractions according to Graefe: among them 17 with $V=1-\frac{2}{3}$; 10 with $V=\frac{1}{2}$; 5 with $V=\frac{1}{3}$; 8 with $V=\frac{1}{4}$; 6 with $V=\frac{1}{5}$; 1 with $V=\frac{1}{6}$; 1 with $V=\frac{1}{8}$; 1 with $V=\frac{1}{10}$; 3 with $V=\frac{1}{12}$. 66 iridectomies, of these 18 for glaucoma; 9 enucleations, 8 optico-ciliary neurotomies, 96 operations on the muscles.

20. SOKOWITSCH. Ophthalmological note. *Militarmed. Journ.*, Feb. 1882. The following visual results were obtained at an examination of the 14th regiment of Russian dragoons. In 2 cases $V=\frac{2}{10}$; in 3 $V=\frac{1}{10}$; in 17 $V=\frac{1}{10}$. The vision was binocular, and Jung's test-types were used.

21. TSCHERNING. Bidrag til su oftalmologisk statistik. Hospitalstitende, second series, vol. ix, No. 7. Copenhagen, 1882. 7564 recruits of the age of 22 were examined. Ametropia of less than 2 D was not considered. 6303 were from Copenhagen, the remainder from the country. Among the former myopia was found in 9.6%, hypermetropia in 4.35%; among the latter myopia in 2.16%, hypermetropia in 2.24%. Maculae corneae were found in 3.5% of the whole number, strabismus in 0.97%: 0.56% convergent, and 0.41% divergent squint. SCHIÖTZ.

22. UHTHOFF. Congenital anomalies of the globe and its adnexa in 10,000 eye-patients, with reports of cases. Schöler's annual report. Berlin, 1882. Conjunctiva 1 case, pigmentation. Cornea 12 cases: in 2 leucomatous opacity, in 6 cornea globosa, in 4 dermoid tumor. Uveal tract 19 cases: in 2 pupillary

membrane, in 4 embryonic threads, in 1 irido-choroiditis, in 3 coloboma of the iris, in 5 coloboma of the iris and choroid, in 1 defect in the choroid, in 3 albinism. Optic nerve and retina 14 cases: in 3 atrophy of the optic nerve, in 1 atrophic discoloration of the temporal half of the disc, in 9 opaque nerve fibres, in 1 congenital amaurosis without any ophthalmoscopic change. Lens 30 cases: in 4 zonular cataract, in 6 shrunken congenital cataract, in 3 nuclear cataract, in 5 cataracta mollis, in 2 congenital dislocation, in 4 posterior polar cataract, in 3 anterior pyramidal cataract, in 2 opacities of the anterior part of the capsule, in 1 an indentation at the lower inner edge of the lens, the lens being otherwise perfectly clear. Muscles 17 cases: in 10 congenital ptosis, in 3 nystagmus, in 1 paralysis of ext. rect., in 1 congenital immobility of both eyes, in 1 bilateral paralysis of the oculomotor nerve, in 1 convergent squint. Globe 2 cases: in 1 left-sided anophthalmus, in 1 hydrophthalmus. Lids 2 cases: in 1 epicanthus, in 1 double lower lachrymal point.

c.—OPHTHALMOLOGICAL JOURNALS.

German Journals.

23. *Arch. für Augenheilk.* Knapp, Schweigger, Vol. xi, 2. Issued Jan. 20, 1882.

24. *Klin. Monatsbl. f. Augenheilk.* Zehender. *January.* 1. Gunning. Are bacteria discharged from the body in the air breathed out? 2. Lewkowsch. Two cases of interstitial keratitis; congenital partial symblepharon. 3. Rheindorf. A case of glaucoma with an acute opacity of the lens.—*February.* 1. Unterharnscheidt. A complete paralysis of the oculomotor nerve and accommodative lenticular astigmatism. 2. Landesberg. Jaborandi and pilocarpine in diseases of the eyes. 3. New instruments.—*March.* 1. Pflüger. The nutrition of the cornea. 2. Juhász. Case of atropine-poisoning cured by pilocarpine.

25. *Centralbl. f. prakt. Augenheilk.* Hirschberg. *January.* 1. Berger. Remarks upon the capsule of the lens. 2. Mandelstamm. A case of corneal fistula. 3. Mandelstamm. Injury to both eyes by a pistol-ball. 4. Wicherkiewicz. Some reflections on so-called warts of the globe. 5. A splinter of wood.—*February.* 1. Denk. An observation in circular and partial closure of the pupil. 2. Stilling. Some remarks on testing the color-sense. 3. Imre. A rare case of osteoma of the orbit. 4. Mayerhausen. Cases of visual disturbance after injury to the skull. 5. Mayerhausen. The removal of foreign bodies from the cornea.—*March.* 1. Weinberg. On diathetic retinitis. 2. Kroll. Contribution to the knowledge of neuro-paralytic keratitis. 3. Rübel. The scrofulous diseases of the conjunctiva and cornea, and their relation to the so-called scrofulous diathesis.

26. *Zeitschr. f. vergleichende Augenheilk.* Berlin, Eversbusch, 1882. I. Department of the journal for veterinary medicine and comparative pathology. In semi-annual volumes. 1. Berlin and Eversbusch. Introduction. 2. Wolf-skehl. Astigmatism in the eyes of animals, and the significance of the slit-shaped pupil. 3. Berlin. The physico-optical structure of the eye of the horse. 4. Westrum. Observations of so-called choked disc in the dog. 5. Eversbusch. Comparative investigations on the finer structure of the iris.

The anatomical basis of the slit-shaped pupil. 6. Eversbusch. The most important contributions to the comparative anatomy of the eye for 1880. 7. Berlin. Pathology and therapeutics of diseases of the eye of animals for 1880.

French Journals.

27. *Revue clinique d'oculistique du sud-ouest.* Armaignac, Sichel, Meyer. No. 1. *January*, 1882. 1. Armaignac. Quelques considérations sur l'étiologie et le traitement de l'ulcère serpiginieux de la cornée.—No. 2. *February*, 1882. 1. Armaignac. Cataracte capsulo-lenticulaire survenue rapidement chez un jeune homme à la suite d'une irido-choroïdite; opération et guérison.—No. 3. *March*, 1882. 1. Armaignac. Ankyloblépharon de la paupière inférieure et symblépharon partiel de la paupière supérieure consécutifs à un phlegmon traumatique de l'œil gauche; traitement de l'ankyloblépharon par la suture élastique de caoutchouc et du symblépharon par autoplastie conjonctivale; libération complète et permanente des paupières permettant l'emploi d'un œil artificiel volumineux. Paralyse isolée et absolue du muscle droit supérieur chez une jeune fille de 17 ans à la suite d'une fièvre typhoïde survenue à l'âge de cinq ans. Paralyse congénitale complète du muscle droit supérieur gauche chez un enfant de 2 ans. Drainage des voies lacrymales.

28. *Archives d'ophtalmologie.* Panas, Landolt, Poncet, *January-February*, 1882, t. ii, No. 1. Bellouard. Kératite professionnelle, incrustations plombiques de la cornée. Baudry. Sur l'emploi du prisme comme moyen de dévoiler la simulation de la cécité unilatérale. Leroy. Optique physiologique. Vision centrale, irradiation, et acuité visuelle. Tillais. Elephantiasis des paupières. Boucheron. De la cure du strabisme convergent intermittent par les mydriatiques ou les myotiques. Nicati. Remarques au sujet des conditions de vue exigées pour le service militaire.

29. *Recueil d'ophtalmologie.* Galezowski, Cuignet. No. 1. *January*, 1882. Mengin. Observation clinique. Galezowski. Migraine ophtalmique avec thrombose des vaisseaux rétinien. Galezowski. Des cataractes traumatiques. Despagnet. Clinique ophtalmologique du Dr. Galezowski.—No. 2. *February*. Latteur et Despagnet. Observation avec examen histologique d'un cas de mélanosarcome de la choroïde. Brochet. Note sur le traitement chirurgical de l'ophtalmie granuleuse. Galezowski. De l'influence des irites et des choroïdites sur le développement des cataractes. Aguilan Blanch. Péri-sclérite rhumatismale. Despagnet. Clinique ophtalmologique du Dr. Galezowski.—No. 3. *March*. Blanch. Péri-sclérite rhumatismale. Despagnet. Clinique ophtalmologique du Dr. Galezowski. Galezowski. Persistance des vaisseaux hyaloïdiens. Than. Des retractions consécutives aux paralysies musculaires.

30. *Gazette d'ophtalmologie.* No. 1. *January*, 1882. Carré. Note de thérapeutique oculaire. Traitement de la kératite ulcéreuse ou ulcère d'emblée.—No. 2. *February*. Carré. Note de thérapeutique oculaire. Traitement de la kératite interstitielle au parenchymateuse.—No. 3. *March*. Carré. Note de thérapeutique oculaire. Traitement de la kératite vasculaire ou pannus.

31. *Annales d'oculistique.* Worlomont. *January-February*, 1882. Giraud-Teulon. Sur les systèmes chromatiques par Donders. Gayet. De la cure de l'entropion par une opération autoplastique. de Wecker et Masselon. Emploi de la galvano-caustique en chirurgie oculaire. Teillas. De quelque

tumeurs de la région orbitaire. Coppez. Neuralgie datante de 20 ans, guérie par l'élongation du nerf sousorbitaire.

32. *Revue générale d'ophtalmologie*. Recueil mensuel bibliographique, analytique, critique. Dor, Meyer. Paris. As collaborators of this new periodical are named: Carreras Aragó, Chodin, Cuignet, Goldzieher, Jacquemet, Magnus, Manfredi, Talko, Swanzy, Wicherkiewicz. No. 1. *January*. 1. Dor, Meyer. Introduction. 2. Gayet. Quelques conseils raisonnés à propos des raumatismes oculaires et des premiers soins à leur donner. 3. *Revue*.—No. 2. *February*. 1. Dor. Kyste congénital de l'orbite, microphthalmie, colobome de l'iris et de la choroïde. 2. *Revue*.—No. 3. *March*. 1. Leroy. Sur la théorie de l'astigmatisme. 2. *Revue*.

Spanish Journals.

33. *La crónica oftalmológica*. Del Toro. *February*. Gastaldo. Luxacion del cristalino por traumatismo en la cámara. Curacion y resultados satisfactorias.—*March*. Gastaldo. Iritis plastica con hipopion é infiltracion purulenta de la córnea. Curacion radical.

34. *Revista especial de oftalmología, sífilografía, dermatología, y afeciones urinarias*. Rodriguez Viforcós. *January*. Perez Caballero. La oftalmometrologia, sus procedimientos y aplicaciones. Cap. ii. Oftalmometria. Apreciacion de las dimensiones lineales, radios de curvatura é indices de refraccion.—*February* and *March* no original ophthalmological papers.

35. *Revista de ciencias médicas*. Carreras Aragó. *January*. Carreras Aragó. El oftalmoscopio de refraccion en los reconocimientos visuales. Carreras Aragó. La homotropina en las enfermedades de los ojos.—*February*. Ritzol. Heridas de la córnea, iris, y cristalino producidas por una esquirla de piston, extraccion del cuerpo extraño y curacion completa.—*March*. Aquilar Blanch. La excision del fondo del saco conjuntival en la granulosis.

Italian Journals.

36. *Annali d'ottalmologia*. Quaglino. Anno x, 6. Guaita. La micrografia applicata all'anatomia patologica oculare. Lettera al Prof. Gayet. Nicolini. Cecità immediata permanente unilaterale successiva a trauma diretto sul bulbo. Ravà. Casuistica clinica.—Anno xi, 1. Amadei. Sulla cranio-logia delle anomalie di refrazione dell'occhio. Albertotti. Sulla determinazione sperimentale della grandezza dell'immagine oftalmoscopica rovesciata. Albertotti. Sulla micrometrà. Rampoldi. Anomalie di prima formazione dell'occhio.

37. *Bolletino oculistica*. Simi. *January*. Danesi. La sclero-coroidite.—*February*. Artikel gegen Specialärzte, die nicht das Allgemeinbefinden der Kranken berücksichtigen.—*March*. Moyne. Guarizione della cataratta incipiente. Falchi. Tuberculosi dell'occhio con glaucoma consecutivo.

38. *Giornale delle malattie degli occhi*. Morano. Anno v. *February*. Morano. Osservazioni cliniche.

English Journals.

39. *The Ophthalmic Review*, a monthly record of ophthalmic science. Grossmann, Smith. *January, February, March*, Nos. 3, 4, 5. Eales. Primary

hemorrhage in young men. Berry. Clinical notes and remarks on two unusual forms of strabismus. Smith. Atropine and eserine in glaucoma. Wood-White. Embolism of arteria centralis : reëstablishment of circulation witnessed with the ophthalmoscope. McHardy. An improved self-registering perimeter. Smith. Atropine and eserine in glaucoma.

40. *Archives of Ophthalmology*. Knapp, Schweigger, vol. xi, No. 1, March.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

41. ABRAHAM. Micrococci in sympathetic ophthalmia. *Dublin Journal*, Feb., 1882.

42. BERGER. De l'observation du réflexe palpébral dans l'anesthésie chloroformique. L'acad. des scienc., Nov. 28, 1881. *Bullet. de thérap.*, Jan., 1882, No. 1.

43. BONAGENTE. Sulla sfinteratomia dell'iride nell'estrazione a piccolo lembo della cataratta e cura consecutiva. Atti dell'assoc. ottalm. ital., Sept., 1881. *Ann. d'ottalm.*, vol. x, 6.

44. BOUCHERON. De la cure du strabisme convergent intermittent par les mydriatiques ou les myotiques. *Arch. d'ophth.*, vol. ii.

45. BROCHET. Note sur le traitement chirurgical de l'ophtalmie granuleuse. *Rec. d'ophth.*, Feb. 1882.

46. BULL, C. S. Treatment of facial scars affecting the lids either directly or indirectly. *Trans. Amer. Ophth. Soc.*, 1881. Bull advises the systematic use of massage, and relates three cases in which this mode of treatment produced good results. BURNETT.

47. CABALLERO. La oftalmometrologia, sus procedimientos y aplicaciones. *Rev. esp. de oftalm.*, Jan., 1882. Chapter ii, Oftalmometria.

48. CARRÉ. Note de thérapeutique oculaire. *Gaz. d'ophth.*, Nos. 1, 2, 3. Discusses the treatment of the various kinds of inflammation of the cornea.

49. DANTONE. Sull'antisepsi nelle operazioni di cataratta. *Ann. d'ottalm.*, vol. x, 6. He earnestly recommends antiseptic treatment.

50. FALCHI. Tuberculosi dell'occhio con glaucoma consecutivo. *Ann. d'ottalm.*, vol. xi, 1.

51. DE FRIESS. Contribution à l'étude des pansements antiseptiques en chirurgie oculaire. *Thèse de Paris*, 1882. Prefers boracic acid; does not recommend the spray.

52. GALEZOWSKI. De l'influence des irites et des choroidites sur le développement des cataractes. *Rec. d'ophth.*, Feb., 1882.

53. GIRAUD-TEULON. Electrothérapie dans les opacités du corps vitré. *Compt. rend. de l'acad. de méd.*, Oct. 18, 1881. *Gaz. d'ophth.*, March, 1882, No. 3.

54. GRADENIGO. Della profilassi antisettica nelle operazioni d'oculistica. Venice, 1882. He is opposed to all antiseptic substances; lukewarm water is best.

55. GUNNING. Are bacteria discharged from the body in the air breathed out? *Klin. Monatsbl. f. Augenheilk.*, Jan. A few oculists had expressed

the opinion, that in operations the air breathed out by the operator might be come dangerous to the eye through the bacteria contained in it. Gunning experimentally disproves this assumption, and comes to the following conclusions: 1. When the air is inhaled it is freed from the bacteria it contained. 2. No micro-organisms are discharged from the body in the air breathed out.

56. HIRSCHBERG. Ophthalmoscopy. *Realencyclopädie*, vol. x.

57. HIRSCHBERG. The reflex immobility of the pupil and a more accurate measurement of paralytic diplopia. Berlin, *Gesellsch. f. Psych.*, Mar. 14, 1881. *Berl. klin. Wochenschr.*, No. 8, 1882. *Arch. f. Psych.*, vol. xii, 2.

58. KLEIN. Massage in ophthalmology. *Wiener med. Presse*, 1882, No. 9.

59. KNAPP. On the extraction of cataract. Clinical remarks. *Med. Record*, vol. xxi, 7.

60. KRAUSE. Anatomical investigations of the ciliary nerves after optico-ciliary neurotomy. *Berl. klin. Wochenschr.*, No. 12. *A. f. A.*, vol. xi, 2. See No. 1 of last year's bibl.

61. KÜMMELL. On stretching of the optic nerve. *Deutsche med. Wochenschr.*, 1882, No. 1. The conjunctiva is incised in the lower outer quadrant, between the external and inferior recti, a squint-hook inserted between them and passed along the globe; and the optic nerve, felt as a tightly stretched cord, seized from above; a few strong tractions are then exerted. The connective tissue of the orbit is scarcely irritated at all by the operation. As to the therapeutic results of this procedure, which thus far has been tried in 7 cases, nothing can be said as yet.

62. DE LUCA. Nuovo metodo per chiudere l'apertura fistulosa del sacco lacrimale. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d'ottalm.*, vol. x, p. 6. The edge of the fistula is abscised.

63. MARTIN. Nouvelles applications du fer rouge en chirurgie oculaire et de quelques modifications apportées aux galvanocautères. *Journ. de méd.*, No. 2, Jan.

64. MAYERHAUSEN. The removal of foreign bodies from the cornea. *C. f. A.*, Feb. If the foreign body lies between the lamellæ of the cornea, a cystotome may be used with advantage.

65. MICHEL. On natural and artificial opacities of the lens. Essay in celebration of the 300th anniversary of the Julius-Maximilian University of Würzburg contributed by the medical faculty, Leipsic, 1882. If an ice-bag be placed on the eye of a young cat, a completely white opacity of the lens develops within a minute, which disappears in about the same time when the ice-bag is removed. Therefore, by reducing the temperature locally an artificial cataract was produced in the eye of the living animal, which again disappeared when the temperature rose through the agency of the restored circulation of the blood. In lenses removed from the eye an intense white opacity which advances from the periphery toward the centre, develops when they are subjected to a certain degree of either cold or warmth; that part of the periphery is first affected which is most exposed to the action of the cold or heat. The change of temperature must be rather sudden and its degree low or high. The opacity produced by cold has a decidedly yellowish tinge and a more or less perceptible lustre. The opacity produced by heat is of a chalky whiteness. The opacity due to

cold appears at the moment of freezing, and disappears as soon as the action of the low temperature ceases. The lens always clears up from the periphery toward the centre. During this process the lens-substance seems to be movable within the capsule, and if the capsule is opened, a large quantity of clear liquid escapes. Besides this aqueous discharge the so-called lens-sutures become much more distinct, and even a bursting of the lens-substance corresponding to the sutures can be demonstrated. When exposed to a temperature of 80° a white opacity rapidly develops, which never again disappears. The lens is then dry and easily crumbled. Salt produces an opacity in the lens of the frog, but the centre of the lens remains transparent. Speaking generally, there are three types of cataract produced by salt, namely: 1, opacity of the corticalis and the outer layers of the nucleus; 2, opacity of the nucleus; 3, opacity of a layer between nucleus and cortex, a so-called perinuclear cataract. The opacity of the lens does not find its optical expression in the loss of water; on the contrary, a certain percentage of water is necessary to let it become visible, and the loss of water must not go beyond a certain limit. Two factors are essential for the formation of an opacity, a physical and a chemical one: of the former kind are the temperature and the loss of water; of the latter, the character of the albuminous substances. The physical factors cause the formation of new chemical bodies which possess different qualities and therefore manifest themselves optically in the form of an opacity of the lens.

The reporter would here call attention to the artificial production of cataract, which Neuner advised as early as 1827 (Graefe u. Walther, *Journ. d. Chirurgie*, vol. x, 4, pp. 480-492) in order to learn the operation. Neuner injected a solution of sublimate into the lens, which then becomes opaque and hard, and therefore well qualified for practising the operation. Of course an artificial cataract is only produced in a lens which is in its normal position.

66. MINOR, J. S. Central color-scotoma—the error of ordinary tests. *Amer. Journ. Med. Sci.*, April, 1882. M. points out the deficiency of the usual method of examination for central scotoma, especially where the color-sense is only partially deficient. The plan which is in most common use is to cause the eye to fix a small bit of color and then advance another bit of color from the periphery of the visual field toward the centre until its brilliancy is diminished to that of the central color. When this is done in all meridians the limit of the scotoma is outlined. Owing to the diminution of retinal sensibility from fatigue, however, this is not a fair gauge of the central diminution of color-perception. In order to obviate this, M. proposes that a disc of colored paper larger than the scotoma be placed before the eye, and the patient be directed to outline on this his scotoma. A series of these discs taken at various sittings would show the progress of the case. BURNETT.

67. MORANO, DEL MONTE, BONAGENTE, ANGELUCCI deny that the corneal opacity after cataract-extraction is due to parasites. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d. ottalm.*, vol. x, 6.

68. MOYNE. Guarigione della cateratta incipiente. *Bollet. d' ocul.*, March.

69. OELLER. Contributions to the comparative anatomy of the cornea, resp. Descemet's membrane. Biological contributions. Jubilee paper for Geheimrath von Bischoff. Munich, 1882. Published in pamphlet form. 1. The

intercellular spaces and the intercellular vacuoles of the endothelium of Descemet's membrane. The reason chiefly lies in a change in the chemical composition of the aqueous humor. 2. The relations between the red and white blood-corpuscles which have entered the anterior chamber and the endothelium of Descemet's membrane.

70. PETTORELLI. Sul delirio consecutivo all' estrazione della cateratta. *Gagliardo da Saliato*, vol. iii, 7. Discusses an article of Saltini (Spallanzani, Jan., 1881) on 5 cases of delirium after cataract-operation observed at the clinic in Modena, and endeavors to show that they were in reality cases of atropine poisoning. DANTONE.

71. PFLÜGER. Ophthalmic clinic of the university of Berne. Report for the year 1880. A mixture of 1½% carbolic acid with 4% boracic acid is recommended as the best antiseptic. 5% solution of resorcin for cleansing the instruments. Resorcin is not brought into direct contact with the eye on account of its irritating action. Hydrochinon is apt to cause dermatitis and colors the patient's face brown. It cannot, therefore, be recommended. Carbolic acid 2-2½%, when chemically pure, is not objectionable; if this is not the case, it easily produces ulcers of the cornea.

72. REID. Removal by electro-magnet of a piece of iron seen in the vitreous. *Glasgow Med. Journ.*, March, 1882. Caused suppurative panophthalmitis.

73. RIBEZZI. Del danno che arrecano i caustici nella cura delle granulazioni palpebrali. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. Is opposed to all cauteries.

74. SCHÖLER. Case of scleral puncture of the retina. Schöler's annual report for 1881. Detachment of the retina completely cured by puncture, but in a few weeks a relapse followed.

75. SCHRÖDER. A new method of splitting the capsule in operating for senile cataract. *Berliner klin. Wochenschr.*, 1882, Nos. 2 and 3. The capsule is split in the centre in the whole length of the vertical meridian. Three lateral incisions are added, beginning from the vertical cut. Out of 42 eyes 41 obtained $V > \frac{20}{100}$; one eye was lost; once there was a moderate loss of vitreous without any injurious consequences.

76. SCHUCHARDT. Tuberculosis vaccinated upon the eye, and its connection with general vaccinated tuberculosis. *Virchow's Archiv*, vol. lxxxviii, 1. In most cases the vaccinated tuberculosis was confined to one or both eyes, and the rest of the body remained healthy.

77. SCCELLINGO. Blefaroplastica eseguita col processo di Fricke modificato. *Ann. d' ottalm.*, vol. x, 6.

78. DE VINCENTIIS. Sulla blefaroplastica. *Ann. d' ottalm.*, vol. x, 6.

79. DE WECKER and MASSELON. Emploi de la galvano-caustique en chirurgie oculaire. *Ann. d' ocul.*, Jan., Feb., 1882.

80. WHITE, J. A. A simple way of performing optico-ciliary neurotomy. *Va. Med. Monthly*, Dec., 1881. He makes the incision in the conjunctiva between the upper and outer recti. A strabismus-hook is then inserted under each of these muscles, and by them the eye is pulled down and toward the

nose. The wound is then rendered more open by inserting a small lid-elevator under the upper lid of the incision. Through this opening the scissors are introduced and the nerves divided. The eye is then rotated on its axis by the double hook of Knapp, and the posterior part of the sclerotic is carefully cleaned. He has operated on three cases with success by this method.

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III.—INSTRUMENTS AND REMEDIES.

81. BLIX MAGNUS. En sjelf registrerande perimeter. *Upsala läkarefär. Förhandl.*, vol. xvii, Nos. 2 and 3.

82. BRANE. A blade-holder. *Klin. Monatsbl.*, Feb. The angle between the blade and handle can be varied to any extent. The blade can be screwed into the holder. Can be obtained from the maker, Brand, in Altona.

83. CARREROS-ARAGÓ. La homatropina en las enfermedades de los ojos. *Rev. de science med.*, Jan., 1882.

84. CHISOLM, J. J. A singular case of hostility to the local use of atropia and duboisia; the first causing facial erysipelas, the second temporary insanity in a patient 70 years of age. *Maryland Med. Journ.*, Dec. 15, 1881.

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85. CUISNIER. De la pilocarpine dans la thérapeutique oculaire. *Semaine méd.*, Jan., 1882, No. 4. In incipient atrophy of the optic nerve. Care must be taken in patients suffering from heart disease or atheromatous degeneration.

86. EMMERT. Hyoscinum hydrojodatum. *A. f. A.*, vol. xi, 2. Its myotic action is very powerful and is surpassed by no other remedy. A solution of 0.01 : 10.0 is sufficient. The conjunctiva bears it well.

87. FRONMÜLLER. Poisoning by pilocarpine. Atropine as an antidote, also homatropine. *Memorabilien*, vol. ii, 1.

88. MCHARDY. An improved perimeter. *Lancet*, No. 4. *Ophth. Review*, vol. i, No. 5.

89. VON HASNER. Keratotomy. Society of German physicians of Prague, March 10, 1882. *Prag. med. Wochenschr.*, No. 13. *Centralbl. f. prakt. Augenheilk.*, March. Recommends the apparatus of Placido (*v. below*, Placido); it may be used either as a tonometer or astigmometer.

90. JUHÁSZ. Case of atropine-poisoning, cured by pilocarpine. *Klin. Monatsbl.*, March.

91. KÖNIG. Leucoscope. Phys. Gesellsch. zu Berlin, Feb. 16, 1882. *Centralbl. f. prakt. Augenheilk.*, Feb. Instrument for testing the relative power of emitting light in various sources of light.

92. LANDESBURG. Therapeutic use of jaborandi and pilocarpine in eye-disease. *Med. & Surg. Rep.*, vol. xvi, No. 5. Opacities of the lens were observed in five cases in man, and one in a horse after the use of pilocarpine.

93. LANGE. Iodoform in blennorrhœa neonatorum. *Petersburg. med. Wochenschr.*, 1882, No. 10. Acts injuriously; luxuriating granulations develop upon the conjunctiva, which finally become so extensive as to injure the nutrition of the cornea, and thus favor the development of corneal lesions.

94. PAJZDESKI. The action of iodoform salve in ophthalmology. *Inaug. Dissert.*, Greifswalde, 1882. One part of iodoform to fifteen of vaseline. Contra-indicated in iritis. Very useful in clearing up the cornea in scrofulous pannus and maculæ corneæ.

95. PAULSEN. Safety apparatus on the spatula. *Klin. Monatsbl.*, March. A little stop on the spatula is intended to prevent it from entering too far into the eye.

96. PLACIDO. Keratoscope. *Centralbl. f. prakt. Augenheilk.*, Jan., Feb.

97. SALTINI. Sulla efficacia del solfato de eserina nella cura delle affezioni glaucomat. *La Spallanzani*, vol. xi, 1 and 2, Jan., Feb., 1882. Effective in the prodromal stage and in acute attacks of glaucoma; makes iridectomy easier.

98. SCHENKE. Atropine-vaseline. *Prager med. Wochenschr.*, 1882, Nos. 1 and 2. Is more effective than the solution and does not have its disadvantages.

IV.—ANATOMY.

99. BENSON. On coloboma of the choroid and of the optic nerve sheath. *Dublin Journ.*, March, 1882.

100. BERGER. Remarks on the capsule of the lens. *Centralbl. f. prakt. Augenheilk.*, Jan., 1882. The capsule consists of lamellæ, of which the outermost one is connected with the zonula Zinii; the lamellæ are united by a cement which is loosened or dissolved in a solution of permanganate of potash. There are nuclei in the lens-capsule of the fetus. The lens-capsule may be classed as connective tissue.

101. EVERSUSCH. Comparative studies on the finer structure of the iris. I. The anatomical reason of the slit-shaped pupil. First communication. *Zeitschr. für vergleich. Augenheilk.*, 1882. I. The following observations were made on the horse: 1. An uninterrupted muscular layer, as it has been described in man and the rabbit, does not exist in the iris of the horse. There are no arcades as can be shown to exist between the dilatator and sphincter pupillæ in man and the rabbit. The connecting links between the dilatator and sphincter pupillæ are simply muscular bands, the arrangement of which may be best compared to the spokes of a wheel. The oblong shape of the pupil of the horse is explained by the existence of an auxiliary apparatus which is attached to the posterior surface of the lens at points corresponding to the shorter diameter, which might be called ligamentum inhibitorium or triangulare iridis.

102. GALEZOWSKI. Persistence des vaisseaux hyaloidiens. *Rec. d'ophth.*, March, 1882.

103. GREFBERG. On the development of Meibom's glands. Communications from the embryological institute of the university at Vienna. Vol. ii, No. 2. Vienna, 1882.

104. HENLE. The development of the crystalline lens and the subdivision of the nucleus. *Arch. f. microsc. Anat.*, vol. xx.

105. LITTLE, W. S. Two cases of persistent hyaloid artery. *Phila. Med. Times*, 1881, and *Trans. Amer. Ophth. Soc.*, 1881.

106. MICHEL. The corneal ridge of the human embryo. Paper in honor

of the 300th anniversary of Würzburg University. Leipzig, 1882. Measurement at different periods beginning with the 5th month. The character of the corneal ridge in the embryo is important in its bearing on certain congenital anomalies of the cornea, for instance megalophthalmus, keratoglobus, keratoconus, and anomalies of curvature.

107. PARINAUD. Nerfs optiques et hémisphères. *Compt. rend. hebdomadaires des séances de la soc. de biologie*, No. 10, March 10. *Gaz. des hôp.*, No. 12, 33.

108. PONCET. De l'état du nerf optique et de la rétine chez un ataxique, aveugle depuis dix ans. *Progr. méd.*, No. 8, Feb.

109. PREISS. The lymph-spaces of Descemet's membrane and their connection with the cornea. At the same time a contribution to the knowledge of the anastomosing corneal cells and their termination on the surface of the endothelium. *Virchow's Arch.*, vol. lxxxvii, 1. On the posterior surface of the cornea a system of tubes (lymph-ducts) can be demonstrated, which lie within the endothelial cells and their immediate substratum. The tubes are connected with the spaces between the endothelial cells and their nuclear membranes, and also with the lacunar spaces.

110. RAMPOLDI. Anomalie di prima formazione dell'occhio. *Ann. d'ottalm.*, vol. xi, 1.

111. RISLEY, S. D. A new trial-glass frame. *Trans. Amer. Ophth. Soc.*, 1881. Two bars which slide past each other through a wedge-shaped block, have attached to them the two semicircular grooves for holding two lenses, with some hooks by which an additional lens can be added. This arrangement allows of a lateral movement of the lenses amounting to 16 mm., or a pupillary distance varying from 50 to 66 mm. It can be held in the hand by means of a handle, or the ordinary spectacle bows can be attached. BURNETT.

112. RITTER. The eye of an acranus histologically examined. *A. f. A.*, vol. xi, 2. Shape of the eye and of its different parts normal; the microscope also showed no deviation from a normal structure. Every layer of the retina was found; only the nerve-fibres, except a small number, were wanting; and the ganglion cells had not quite reached their usual development.

113. SCHMIDT-RIMPLER. Opticus. *Realencyclopädie*, vol. x.

114. SPINA. On absorption and secretion. Leipzig, 1882, chap. xiii. Investigations of the living epithelium of the cornea. The variations in volume of the epithelial cells of the cornea of the frog; on adding blood-serum or water the epithelial layer becomes higher and the separate cells become more distinct. The same is the case when the cornea is tetanized or mechanically irritated.

V.—PHYSIOLOGY.

a.—GENERAL PHYSIOLOGY: OPTICS, CORNEA, IRIS, REFRACTIVE MEDIA.

115. ABADIE. Du vertige oculaire. *Progr. méd.*, Jan. 1882, No. 1. In some cases the patients become dizzy when looking in certain directions or when moving the eyes.

116. BERLIN. The physico-optical structure of the eye of the horse. *Zeitschr. f. vergleich. Augenheilk.*, 1882, vol. 1. The eyes of the horse, as

of all domestic animals, perhaps even of all vertebrates, are hypometropic. They show two kinds of astigmatism : one is irregular and due to a certain difference of refraction in layers of the lens equally far from the surface ; the other is regular and ascribable to the asymmetry of the meridians of the cornea. The latter kind seems to have a definite character, inasmuch as the meridian of least curvature coincides with the longest diameter of the horizontally oval pupil (*v. Wolfskehl*, this bibl.), while the meridian of greatest curvature is about perpendicular to the longest diameter.

117. CHARPENTIER. Remarques sur la sensibilité différentielle de l'œil. *Arch. d'ophth.*, 1882, Jan., Feb., No. 2. He means by this expression the power to distinguish between two different degrees of intensity of light. The sensibility varies when the different intensities act simultaneously upon the eye or in succession : when two intensities act upon the eye at the same time, they must differ by one hundreth ; when successively, by 7 or 8 one hundreths.

118. EHRLICH. On induced fluorescence in the eye. *Deutsche med. Wochenschr.*, 1882, Nos. 2-4. Ehrlich recommends subcutaneous injections of fluoresceïn for studying the changes of nutrition, which cause very intense phenomena of fluorescence in the eye. He has shown by these experiments, that the anterior surface of the iris has nothing to do with the reproduction of the aqueous humor, which comes entirely from the posterior chamber. The liquid is not derived from the vitreous by transudation, but is principally secreted by the blood-vessels of the ciliary body. Under normal conditions the aqueous humor is secreted in an entirely different manner ; two centres of secretion exist at the periphery of the iris, an anterior nasal and a temporal one ; they throw the liquid with a certain force and in a fixed direction upon the posterior surface of the cornea, after which the stream moves in a horizontal direction. An angle is formed at the point where the currents meet. The secretion of the posterior chamber is widely different from the aqueous humor.

119. GRADENIGO. Dell' ascoltazione dell' occhio. *Ann. d'ottalm.*, vol. x, 6. Three kinds of sounds may be heard on the eye : 1. A muscle-sound, resembling the humming of flying insects. 2. Sounds heard at in- and expiration and due to the respiratory organs, as the nose, etc. 3. A sound heard when the muscles contract ; it is clearly defined and can be easily distinguished from the others.

DANTONE.

120. KESTEVEN. Xanthopsis. *Lancet*, No. 5.

121. KRONER. The perceptions of the new-born. *Breslauer ärztl. Zeitschr.*, Feb. 18, 1882, No. 4. A new-born child cannot control the motions of the muscles of the eye. There is perception of light. The reflex-arch from the optic nerve to the facial nerve supplying the lid and the branch of the oculomotor nerve supplying the iris is completely developed. In regard to the motion of the eyes he is inclined to think that at birth there is no preformed nervous mechanism ready to exercise binocular symmetrical vision.

122. LEROY. Optique physiologique, vision centrale, irradiation, et acuité visuelle. *Arch. d'ophth.*, Jan., Feb., 1882.

123. MACÉ and NICATI. Relation entre la loi de Bouguer-Masson et le phénomène de Purkinje. *Compt. rend. des séances de l'acad.*, Mar. 20, 1882.

124. MORIGGIA. The movements of the iris and their mechanism under

various conditions and in different animals, especially rabbits and goats, studied when mydriasis is produced by atropine or irritation and division (?) of the sympathetic nerve. Moleschott's investigations on the natural history of man and animals. Vol. xiii, 1. Giessen, 1882.

125. PFLÜGER. The nutrition of the cornea. *Klin. Monatsbl.*, March. The cornea is not nourished by the aqueous humor, as Knies and Weiss erroneously maintain, but from the conjunctiva and sclera. In general the conjunctiva nourishes the superficial, the sclera the deeper layers of the cornea. Within the cornea the lymph-current flows in a centripetal direction from all points of the periphery, then turns inward and enters the aqueous humor. No centrifugal countercurrent of any consequence from the aqueous humor into the cornea exists.

126. SCHÖLER and UHTHOFF. The significance of fluoresceïn for the exchange of liquids in the eye. Annual report for 1881. Berlin, 1882. They come to the following results: 1. Under normal conditions the iris does not cut off the communication between the anterior and posterior chambers, the aqueous humor being constantly renewed from the latter. 2. A current passing from the vitreous through the zonula or Petit's canal and the iris into the anterior chamber does not exist. 3. The anterior surface of the iris does not take part in the renewal of the aqueous humor, which is derived from the blood-vessels of the ciliary body and the posterior surface of the iris, the "secretory angle." This current gives rise to Ehrlich's line, which always begins behind the iris at the edge of the pupil. 4. The secretion from the "angle" does not take place simultaneously over its whole surface. 5. The greater part of the current which exists in the eye flows along the iris through the pupil into the anterior chamber, a smaller portion of it going into the lens through Petit's canal and into the vitreous. Vitreous and anterior chamber are therefore not separated from each other. 6. If the fluoresceïn before its discharge has passed the vascular system of the eye (subcutaneous injection), only a small part of it enters the lens and vitreous, the effect of which soon disappears. If, however, it is injected into the anterior chamber, a large proportion is absorbed by the lens; but when injected into the vitreous, it enters the lens only when it has previously passed into the anterior chamber. 7. The colored fluid is absorbed by the lens from the corticalis toward the nucleus, and disappears in the same order. The innermost parts of the nucleus become colored only after two to three weeks. 8. The vitreous does not participate in the nutrition of the lens, as the latter remains uncolored for days though the whole vitreous is deeply stained, provided the aqueous humor had not previously become colored. This latter event, after an injection into the vitreous, favored and produced as it is by an increase of tension in the vitreous and a decrease in the anterior chamber, does not take place through physiologically pre-existing paths. 9. Opening the anterior chamber (puncture, sclerotomy, iridectomy) changes both the quantity and quality of the fluid discharged from the secretory angle, and in this manner influences the nutrition of the lens and vitreous. 10. The secretion of the aqueous humor is controlled by nervous influence. Division of the cervical branch of the sympathetic nerve, with or without excision of the superior cervical ganglion, causes the appearance of the colored secretion in half the normal time, and decreases the quality of the secreted liquid. The subcutaneous injection of fluoresceïn

is therefore a new method of determining trophoneuroses of the eye which thus far could not be diagnosticated. Secretory and oculo-pupillary fibres of the sympathetic nerve spring with separate roots from the spinal cord, so there are special secretory nerves for the eye. 11. Intracranial division of the trigeminus hastens, increases, and changes the secretion of the eye still more than division of the cervical branch of the sympathetic nerve. 12. As division of $\frac{3}{4}$ of the nerve in the posterior section of Gasser's ganglion does not alter the secretion in the eye, provided the most medial part be preserved, the secretory fibres must be within the medial fourth.

127. STELLWAG VON CARION. On central vision. Papers on practical ophthalmology. Vienna, 1882, chap. 5. 1. The formula of Snellen is not suited to express with any degree of accuracy the ratio of the visual power of different eyes to each other and to a standard universally agreed upon. 2. To determine this ratio, all the factors which influence the size and brightness of the retinal images, should be accurately known in each case, so that they can enter into the calculation as fixed numbers. 3. As this is practically impossible, we must confine ourselves to determining the power of an eye by giving the greatest distance at which, under good illumination, it can easily and accurately recognize certain objects. 4. The test-types prepared for this purpose are the most suitable objects. 5. The power of the eye must first be tested for the various distances which fall within the range of distinct vision in accordance with the refraction and accommodation, so that auxiliary lenses are unnecessary. The finest type which the eye can see is first determined, and then the greatest distance at which it can be read; if the position of the far point permits it, the same experiment is made with print of medium and large size. 6. Correcting glasses are used for distances beyond the range of distinct vision. 7. The examination should be carried on in bright daylight falling from one side upon the test types. 8. The results arrived at should be reported without any changes, but the kind of refraction and breadth of accommodation added.

128. VON VINTSCHGAU. Farther observations on the movement of his own iris. *Arch. f. d. ges. Phys.*, vol. xxvii, 3 and 4.

129. WOLFSKEHL. Astigmatism in the eyes of animals and the significance of the slit-shaped pupil. *Zeitschr. f. vergleich. Augenheilk.*, 1882, vol. i. The eyes of calves and cats show a marked corneal astigmatism; in the eye of the cat the meridian of least curvature always coincides with the longest diameter of the pupil; this seems to indicate that in this animal there is a constant relation between the slit-shaped pupil and the asymmetric refraction. It might be defined more accurately by saying that the eye of the cat, when the pupil becomes slit-shaped under the influence of light, not only excludes in a very perfect manner all the rays which undergo irregular refraction through the cornea, but also reduces the refractive power.

b.—RETINA, OPTIC NERVE, CENTRAL ORGANS, ACCOMMODATION MUSCLES.

130. ANGELUCCI. L'azione della luce e dei colori sull'epitelio retinico. *Ann. d'ottalm.*, vol. x, 6. *Italia medica*, 1882, No. 5. *Gaz. med. di Roma*, 1882, No. 1. Continuation of the investigations begun by Boll on the physiological importance of the pigment epithelium of the retina. Under the influence of light the grains of pigment wander through the layer of rods and

cones, a phenomenon which is not observed in the dark. The pigment cells, however, never retire completely from the rods, but constantly inclose the outer third. The time necessary for the ascent and descent of the pigment is exactly the same as that observed in the appearance and disappearance of the visual purple. In 6-10 minutes the visual purple is bleached under the influence of light, and the same length of time is required by the pigment to inclose the rods. In 1-1½ hours the visual purple is reproduced, and the same time is required for the return of the pigment to its original position away from the rods. The pigment epithelium is intended for the protection of the rods, especially to neutralize in connection with the reaction of the pupil the varying intensities of light upon the sensitive elements of the retina. Colored light has a varying influence on the movement of the epithelium. After an hour's exposure to red light the pigment does not change its position; yellow rays only cause a slight movement, but it is very marked in green and blue light; it becomes perceptible after an exposure of 10-15 minutes. Under colored light the movement does not depend upon the intensity, but upon the wavelength. As regards the nature of this movement, Angelucci says that the grains of pigment really move along the offsets of the cells.

131. MICKLE. Localization of the visual centres of the cerebral cortex. *Med. Times and Gazette*, 1648.

132. SCHMIDT-RIMPLER. The specific reaction of the optic nerve for mechanical irritation. *Centralbl. f. d. med. Wissensch.*, 1882, No. 1. Direct irritation of the optic nerve with a pear-shaped electrode in patients whose eyes had recently been enucleated, showed that the optic nerve has a specific reaction, which manifests itself to the patients as a sensation of light.

133. STELLWAG VON CARION. The breadth of accommodation and its relation to the choice of glasses. *Papers on practical ophthalmology*. Vienna, 1882, chap. vi, p. 301.

C.—PERCEPTION OF COLORS.

134. BAYER. On acquired color-blindness. *Prager med. Wochenschr.*, Nos. 4 and 5.

135. DONDERS. New researches on the systems of color-sense. Utrecht, 1882.

136. VON FLEISCHL. The theories of color-perception. *Wiener med. Jahrb.*, 1882. *Vide* our last year's bibl.

137. GORHAM. On the blending of colors, by the sole agency of the sensorium. *Brain*, vol. xvi.

138. HÄUSELMANN. Popular treatise on color-perception. Zurich, 1882. With eight colored plates. For use in academies, high-schools, seminaries, trade-schools, and self-instruction of artists and laymen. It is divided into a theoretical and a practical part. The former contains the commonest physiological and physical phenomena; the latter treats of the use of colors in painting. He accepts the evolution of the color-sense from the light-sense, and advocates educating the color-sense.

139. HILBERT. The perception of the phenomena of fluorescence by the color-blind. A physico-physiological study. Königsberg, 1882. The color-

blind observe the fluorescence of such bodies only whose colors they can perceive, and although the fluorescent light is composed in each case of several kinds of homogeneous light, they generally do not recognize the components, although they may belong to their system of colors. Totally color-blind persons very probably cannot observe fluorescence in any substance, the red-green blind only in substances which fluoresce blue or yellow, the blue-yellow blind only in such as fluoresce red or green. Fluorescent substances should be well adapted for diagnosing color-blindness. This method, however, cannot be employed in the examination of large numbers of people, as sunlight alone can be used. Another objection is that the person to be examined is asked the color of the fluorescent substance. On account of the difference between the perception of colors by the color-blind and the normal eye it is not advisable to ask the names of colors. Besides, Hilbert did not employ Holmgren's test in the manner prescribed, but in the less reliable modification with light-red worsteds as test I. Good results were obtained with Stilling's plates. Declares in favor of Hering's theory.

140. JEFFRIES. Color-names, color-blindness, and the education of the color-sense in our schools. *Educational International Magazine*, vol. ii, 4, Mar.-Apr., 1882. Advocates the system of Magnus.

141. MACGOWAN. Color-blindness. *Lancet*, Jan., 1882. Among 1,000 Chinese and Japanese not one color-blind person.

142. SANROMAN. Estudios sobre el Daltonisme aplicado a la navegacion. *Bolet. de med. naval.*, Jan., 1882. Continued.

143. SCHUBERT. Perception of color and color-blindness. Paper read before the society for natural history at Nürnberg, Feb. 22, 1882. Correspondent für Deutschland, 1882, Nos. 111-139.

144. STILLING. Some remarks on testing color-perception. *Centralbl. f. prakt. Augenheilk.*, Feb. Argues against Mauthner, who denies the utility of the colored shadows and pseudo-isochromatic plates for diagnosing color-blindness.

145. THOMPSON. The practical examination of railway employees as to color-blindness, acuteness of vision and hearing. *The Med. News*, Jan., 1882. The paper criticises the resolutions of the ophthalmic section at London, which he cannot subscribe to or sanction. Stilling's method can only be employed by skilled specialists, and can therefore not be introduced generally. Holmgren's method is undoubtedly the best. He has described a modification of this method; as it only affects minor details, he refers to the paper itself.

B.—ANOMALIES OF REFRACTION AND ACCOMMODATION, LIDS, LACHRYMAL APPARATUS, MUSCLES AND NERVES, ORBIT AND NEIGHBORING CAVITIES, CONJUNCTIVA, CORNEA, AND SCLEROTIC.

By DR. C. HORSTMANN.

I.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

146. BERTIN-SANS. Le problème de la myopie scolaire. *Ann. d'hyg.*

publ., Jan., 1882. The paper treats of myopia caused resp. aggravated by study at school, and the steps to be taken to prevent it.

147. AMADEI, GUISEPPE. Sulla craniologia delle anomalie di refrazione dell' occhio. *Ann. d' ottalm.*, vol. xi, p. 3. Discusses the influence of the formation of the skull on the kind of refraction.

148. LEROY. Sur la théorie de l' astigmatisme. *Rev. génér. d' ophth.*, 1882, No. 3.

149. ADAMS. Exceptionally high degree of spasm of accommodation. *The Lancet*, 1882, No. 4.

II.—LIDS.

150. HASNER. Ankyloblepharon filiforme adnatum. *Zeitsch. f. Heilk.*, vol. ii, p. 429. In a child 2 days old a thread of skin 1 cm. long and as thick as a thread, was found stretching from the outer margin of one lid to the other, which tore on the fourth day. It consisted of neoplastic fibrillary tissue.

151. ARMAIGNAC, H. Ankyloblepharon de la paupière inférieure et symblepharon partiel de la paupière supérieure consécutif à un phlegmon traumatique de l' œil gauche. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 3, p. 49. Armaignac operated an ankyloblepharon and a partial symblepharon, caused by a traumatic phlegmonous inflammation, by ligating the former with a rubber suture, and by transplanting a conjunctival flap upon the latter. The lids remained freely movable and permitted the use of an artificial eye.

152. LEWKOWITSCH. Congenital partial symblepharon. *Klin. Monatsbl. f. Augenheilk.*, vol. xx, p. 14. In a boy 12 years old a horizontal bridge of mucous membrane without blood-vessels was found, which sprang from the inner surface of the outer canthus and ended with a fan-shaped insertion on the posterior part of the conjunctiva.

153. GAYET. De la cure de l' entropion par une opération autoplastique. *Ann. d' ocul.*, 1882, p. 27. Gayet operates for entropium by making an incision parallel to the edge of the lids at the inner part. Then he prepares a flap of the same length as the wound at the inner portion from the outer portion of the lid, reverses the flap, and fastens it to the inner side.

154. TOSSWILL. Ectropion successfully treated by transplantation of skin from the arm. Mr. Louis Tosswill, of Exeter, reports a case of ectropion, due to an extensive burn, which was successfully treated by this method. The eversion of the lids was so extensive before the operation that the globe was exposed during sleep. This was rectified by the operation, and the transparency of the inflamed and opaque cornea was restored. *Brit. Med. Jour.*, Jan. 7, 1882, p. 9. FITZGERALD.

155. LAWSON, G. Ectropium of the upper lid remedied by transplanting a piece of skin from the arm. *The Lancet*, Jan., 1882, p. 13. Lawson operated for ectropium by transplanting a piece of skin from the arm, with good result.

156. ABADIE. De l' autoplastie des paupières. *L' union méd.*, 1882, No. 8, p. 87. In a girl 20 years old an ectropium was formed after an extensive destruction of the skin, the forehead, and the temple by burn. The edge of

the lid was freed by a cut 6 *cm.* long, and a piece of skin taken from the arm transplanted into it, which healed in well. The author advises to keep the transplanted flap warm during the first 48 hours. V. MITTELSTÄDT.

157. RAMPOLDI. Fimosi e ptosi palpebrale congenita atrophica. *Ann. d'ottalm.*, vol. xi, p. 31. Rampoldi reports a case of congenital phimosis and ptosis. The muscles of the lids were completely atrophic.

158. BAJARDI, DANIELE. Dell' adenite scrofulosa in rapporto con alcune affezioni oculari. *Gaz. degli ospitali.* The author discusses scrofulous blepharadenitis and its connection with other ocular affections.

159. GERIN-ROZE. Blépharite tuberculeuse. *Gaz. méd. de Paris*, No. 9.

160. PFLÜGER (Rep. of the ophthalmic clinic of Berne University for 1880, Berne, 1882, p. 49) describes a syphilitic ulcer of the lid. The inner angle of the right eyelid was wanting; an ulcer with a lardaceous fundus and sharp margin had formed in its place; its surroundings were hard and infiltrated. Cured by antisyphilitic treatment.

161. BUSINELLI. Un caso di degenerazione amyloide del tarso. *Ann. di ottalm.*, vol. x, p. 6. The disease had existed for 10 years, and was especially marked in the lower lid. Normal appearance was restored by removing the degenerated tarsus. Histologically the case resembled that observed by Vogel and reported in *Graefe-Saemisch*, vol. iv, p. 442. DANTONE.

162. TEILLAIS. Éléphantiasis des paupières. *Arch. d'ophth.*, vol. ii, No. 1, 1882. In a woman 75 years old a large, fluctuating tumor of both upper lids was found, which hung down upon the cheeks. It contained a serous liquid. Both tumors were excised. The microscopic examination showed reticulated connective tissue, with small and large meshes, atheromatous degeneration of the blood-vessels, marked development of the lymph-vessels, and around them an infiltration of round cells.

163. WHERCY. Chancre on eyelid. *The Lancet*, No. 4.

164. HALL. Contribution to the knowledge of the connection between blepharitis ciliaris and ametropia. *N. Y. Med. Rec.*, April 15, 1882. Among 10 cases of blepharitis ciliaris, 9 showed some kind of ametropia.

165. HIRSCHBERG (*Berl. klin. Wochenschr.*, No. 4) observed a case of blepharitis which was caused by phthiriasis pubis on the lashes.

166. FINNY (*Dublin Journ. of Med. Sci.*, March, 1882, p. 201) reports a similar case.

167. CASPER. Abscess of the lid in connection with caries of the roots of the teeth. *Centralbl. f. A.*, 1882, p. 106. Casper reports 2 cases, of a woman and a child, in which abscesses of the lids developed in connection with abscesses due to dental caries.

168. REID. Epithelioma of upper eyelid. *Brit. Med. Journ.*, Feb. 4, 1882, p. 160. The tumor, which had existed for 10 years in a man of 68, occupied the greater part of the upper eyelid and extended downward over the inner canthus. The tumor had taken origin from the sudoriferous glands. Patient's father and elder brother had died from the same disease of the lip.

FITZGERALD.

III.—LACHRYMAL APPARATUS.

169. ARMAIGNAC. Drainage des voies lacrymales. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 3, p. 58. Armaignac recommends drainage in severe cases of dacryocystitis.

170. SBORDONE. Excissione della parete anteriore o estirpazione dell' intero sacco lagrimale? *Il monimento med. chir.*, vol. xiv, fasc. i. In severe cases of dilatation of the lachrymal sac, in which total extirpation had been advised, Sbordone considers the excision of the anterior wall sufficient to produce the same effect. DANTONE.

171. BULL. Syphilitic diseases of the lachrymal apparatus. *N. Y. Med. Journ.*, April, 1882. B. treats in this paper, 1st, of the syphilitic lesions of the lachrymal gland. He states that the gland appears to be free from gum-mous infiltration, and, in fact, any form of syphilitic disease of the gland is rare. 2d. Syphilitic lesions of the lachrymal caruncles. 3d. Syphilitic lesions of the canaliculi, sac, and duct. BURNETT.

IV.—MUSCLES AND NERVES.

172. THEOBALD. What constitutes insufficiency of the internal recti muscles? *Amer. Jour. Med. Sci.*, April, 1882. T. has found a degree of insufficiency, ascertained by means of the vertical diplopia test, in a large number of eyes where there was no complaint of asthenopia. He is at a loss to know where to draw the line between normal and pathological insufficiency. He therefore concludes that a very considerable divergence (even of 22° for the vertical line and dot test of Gräfe) does not of necessity indicate a pathological insufficiency of the int. recti. BURNETT.

173. HARLAN. Case of intermittent concomitant convergent strabismus. In a healthy boy, three years old, the strabismus has been of a tertian type for a year. Later the attacks became irregular, appeared at greater intervals, and now, three years after the affection began, they are very rare. *These ARCH.*, vol. x, No. 3.

174. STELWAG. Papers on practical ophthalmology. Complement to the text-book. Vienna, 1882, No. 7. Genuine convergent strabismus must be explained as an excess of convergence, which latter naturally is coördinate to the accommodation, practised to reduce the great strain upon the accommodation and gradually become a habit; this excess of convergence is voluntary, though not practised from choice. The result of the squint-operation, in many cases so brilliant, is really not a true cure, but a masking of the affection.

175. TESSUT. Recherches sur le mode de cicatrisation du tendon après la strabotomie, *Rec. d' ophthalm.*, Feb., 1882. After the tenotomy of a muscle the end of the tendon again attaches itself to the sclera by means of fibrous bands, more seldom to the conjunctiva. Care should be taken in dividing the tendon of the internal rectus, as the muscle withdraws to a considerable degree.

176. BOUCHERON. De la cure du strabisme convergent intermittent par les mydryatiques ou les myotiques. *Arch. d' ophthalm.*, vol. ii, 1. Atropine treatment is useful in beginning of periodic convergent hypermetropic squint, as it paralyzes the accommodation and thus prevents the tendency toward ex-

cessive convergence. The atropine cannot be dispensed with, until not even a momentary strabismus is apparent when looking at an object held close. Glasses completely correcting the hypermetropia should then be worn. Eserine may be given at the end of the atropine treatment and in those rare cases in which convergence increases under mydriatics.

177. MORANO. Contribuzione alla patogenesi dello strabismo ottico. *Giorn. delle malatt. degli occhi*, vol. v, Feb., 1882. Convergent squint in a child 20 days old; five days previously a violent catarrh of the lachrymal ducts and the conjunctiva had sent in. The squint did not disappear until two months after the inflammation had ceased. The author thinks that an inflammation of Tenon's capsule was the cause. DANTONE.

178. BERRY. Clinical notes and remarks on two unusual forms of strabismus. *Ophth. Rev.*, vol. i, No. 3, Jan., 1882, p. 46. In the first case patient, æt. 41, had complained of occasional diplopia for five weeks previously. This had latterly become persistent. Refraction emmetropic. V normal. Convergence of optic axis for ∞ , homogeneous diplopia. Diplopia and relatively too great convergence up to within 2 feet. Left eye used for fixation. Pupils small and inactive. Patient had been in a very depressed state on account of domestic troubles. Berry looks upon this case as one of spasm of convergence, probably brought about by some temporary irritation of the centre of convergence. The second case was a man, æt 22, who complained of dimness in the sight of the left eye, which had come on two weeks ago. He had divergence for $\infty = 3''$, and generally used the right eye for fixation, whose vision was normal. Pupils motionless. No divergence for near vision. FITZGERALD.

179. THAN. Des rétractions consécutives aux paralysies oculaires et de leur traitement chirurgical. *Rec. d'ophth.*, 1882, No. 3. Paralysis of the muscles of the eye may be treated in three ways: by medicamentation, by prisms, and by an operation. If the paralysis does not disappear after some length of time under medicines, prisms may be used as a palliative if the deviation is but slight. In the rest of the cases the operative method should be resorted to. In low degrees the antagonist of the paralyzed muscle is divided; in higher degrees the paralyzed muscle is advanced besides.

180. RANKIN. Spasmodic neuralgia. *Med. Rec.*, 1882, No. 9.

181. UNTERHARNSCHEIDT. On incomplete paralysis of the oculomotor nerve and accommodative astigmatism of the lens. *Leh. Monatsbl.*, vol. xx, p. 37. In a chlorotic girl of 11, paresis of accommodation developed after a severe attack of gastralgia. The right pupil was wider than the left. Besides this there was crossed diplopia. This condition was explained by the curvature of the lens which had developed unequally. The diplopia disappeared after using iron, but the accommodative astigmatism of the lens persisted for some time.

182. LICHTHEIM. On nuclear paralysis of the muscles of the eye. *Corr.-Bl. f. Schweizer Aerzte*, 1882, Nos. 1 and 2. In a formerly healthy girl of 21 paralytic ptosis and exophthalmus developed in both eyes, in the left more marked than in the right. All the muscles of the right eye were affected, except the ext. rect. and sup. obl. All the muscles of the left eye were paralyzed. Both pupils showed normal reaction, the accommodation also. The

author thinks that the affection was due to a lesion of both nuclei of the oculomotor and of the left trochlearis and abducens nerves.

183. WARNER. Atrophy of the muscles supplied by the fifth cranial nerve, with atrophy of the orbital fat on the same side ; remarks. *The Lancet*, Jan., 1882, p. 13.

184. ARMAIGNAC (*Rev. d' ocul. du sud-ouest*, vol. iii, 3, p. 53) reports a case of paralysis of the superior rectus in a woman of 27, which had developed after typhoid fever in her fifth year. He also observed a congenital paralysis of the left superior rectus in a child 2 years old.

185. COPPEZ. Neuralgie, datante de vingt ans, guérie par l' élongation du nerf sous-orbitaire. *Ann. d' ocul.*, Jan., Feb., 1882, p. 59. A miner of 51 had suffered from neuralgia of the right side of the face for 20 years, which had resisted all remedies. It was cured by stretching the infra-orbital nerve.

186. LETULLE. Sur un cas de zona ophthalmique compliqué de paralysie faciale. *Arch. de physiol.*, vol. i, p. 162. He reports a case of herpes zoster ophthalmicus which was accompanied by paralysis of the facial nerve.

V.—ORBIT AND NEIGHBORING CAVITIES.

187. IMRE. A rare case of osteoma of the orbit. *Centralbl. f. A.*, 1882, p. 41. The author saw an osteoma of the orbit in a woman 62 years old, $8\frac{1}{2}$ cm. long, $6\frac{1}{2}$ cm. thick, and 6 cm. high. It was said to have existed for 42 years, and had so displaced the eye that the cornea was on a level with the corner of the mouth. The tumor was cast off spontaneously after an inflammation which lasted a year. Healing was good and the eye almost regained its original position.

188. TEILLAIS. De quelques tumeurs de la région orbitaire. *Ann. d' ocul.*, Jan.-Feb., 1882, p. 44. In a man of 32 a cyst developed from the frontal sinus, which dislocated the left eye downward. After its removal the eye again resumed its normal position ; nothing remained but a scar in the supra-orbital region. In a young man of 19 an ivory tumor sprang from the frontal sinus, which dislocated the eye downward. As the tumor had a broad base, it could only be partially removed.

189. DOR. Kyste congénital de l' orbite, microphthalmie, colobome de l' iris et de la choroïde. *Rev. génér. d' ophthalm.*, 1882, No. 2, p. 81. Dor describes a congenital cyst of the orbit, which was complicated with microphthalmus ; the eye had a coloboma of the iris and choroid.

190. DUFAIL. Des sarcomes de l' orbite et de leur traitement par l' extirpation des parties molles. *Thèse de Paris*, 1882. In sarcomas of the orbit Dufail advises exenteration.

191. PORTER. Reticulated round-cell sarcoma of the orbit with secondary growth internally, containing melanotic deposits. *N. Y. Med. Rec.*, Jan., 1882, p. 104.

192. ROSMINI. Un caso di esoftalmo da tumore sanguigno cavernoso retrobulbare trattato coll' elettrolisi. *Ann. d' ottalm.*, vol. x, 6, 1882. Case of a girl of 16, in whose left eye the tumor had existed since her third year ; it had grown considerably the first month after menstruation had begun. Electrolysis

(by inserting a steel and platinum needle) was resorted to three times at intervals of two weeks, fifteen minutes each time, and was followed by rather severe general symptoms. The shrinkage was considerable, so that the globe, otherwise normal, again became freely movable. DANTONE.

193. BERGER. Aneurisme artérioso-veineux de l'orbite. *Bull. et mém. de la soc. de chir. de Paris*, vol. vii, 11.

194. DE CAPDEVILLE. Tumeur de l'orbite. Extirpation. Guérison. *Marseille méd.*, 1882, No. 1. In a woman of 44 a high degree of exophthalmus had existed for 15 years, unaccompanied by any reduction of mobility, either of the globe or the upper lid, but by visual disturbances. It was caused by a cavernous angioma, which had developed in the posterior part of the cone of muscles, and was excised with great loss of blood. After ten days it had healed with considerable improvement in vision. V. MITTELSTÄDT.

195. PEYROT. Angiome fibreux de l'orbite. *Gaz. hebdom. de méd. et de chir.*, 1882, No. 7, p. 113.

196. HOTZ. Fatal tetanus caused by a piece of wood in the orbit. *Chicago Med. Rev.*, vol. v, 1, p. 14. Hotz reports a case of injury, in which a piece of wood 2" long and $\frac{3}{4}$ " wide entered the orbit. It caused tetanus with fatal termination.

197. NOYES. A case of pulsating exophthalmus. *Trans. Amer. Ophth. Soc.*, 1881. In a girl of 8 the tumor developed four years ago after a febrile disease. Pressure upon the carotid caused the pulsation but not the exophthalmus to disappear. The art. angularis was ligated and a series of ligatures then applied around a distended blood-vessel down into the spheno-maxillary fissure. Noyes thought that it was the anterior orbital vein, which, coming from the spheno-maxillary fissure, empties into the cavernose sinus. The wound healed, and six weeks later the exophthalmus had disappeared.

198. EALES. *Birmingham Med. Rev.*, Jan. 4, 1882, p. 46. Pulsating exophthalmus, with paralysis of 3d, 4th, 5th, 6th, and 7th nerves, and blindness from absolute glaucoma, following severe crush of the head. Probably fracture of petrous bone and rupture of internal carotid. E. NETTLESHIP.

199. SCHNAUBERT. Case of morbus Basedowii. *Klin. Wochenschr.*, No. 13, p. 201. Milk diet; considerable improvement; relapse; death.

HIRSCHMANN.

200. HOCK. Orbit. *Eulenberg's Real-Encyclopädie d. ges. Heilk.*, vol. x, p. 193-207.

VI.—CONJUNCTIVA, CORNEA, SCLEROTIC.

201. HAUSSMANN. *Blennorrhœa neonatorum*. Stuttgart, F. Enke, 1882, 175 pages. Most cases of blennorrhœa neonatorum are due to infection with the vaginal secretion of the mother, though the lochia or the sero-purulent secretion of a sore nipple or inflamed breast may also be the cause. It may also be produced by pus from a sore upon the child, or by foreign animal tissue, especially pieces of the placenta placed upon the eyes. One eye may also infect the other, or it may be conveyed upon the eye by the substances used in oiling the finger or for local application. In order to prevent the infection

every women should be cautioned to check while yet pregnant any discharge of the genital organs. If an increased secretion is not noticed until the beginning or during the course of the birth, a moderate mucous secretion may be stopped so completely by prophylactic irrigation and careful disinfection of the vulva in case of a moderately long birth-act of a multipara, that it is sufficient to disinfect the eyelids after the head is born in order to prevent infection. If there is a profuse purulent, or thin serous discharge, however, the genital organs must be frequently cleansed. The lids and their surroundings should be carefully disinfected after the birth of the head, and before they are first opened, in order to prevent any infectious substances from reaching the conjunctiva. If it was impossible to amply these prophylactic measures before the eyes were opened, a 2% solution of nitrate of silver should be dropped into the conjunctival sac. After the birth of the child great care should be exercised that the lochia or the secretion of a sore nipple does not come in contact with the eye. In lying-in hospitals and foundling asylums the strictest disinfection should be practised, and the children with healthy eyes should be kept apart from those with sore eyes.

202. STELLWAG. The treatment of ophthalmo-blennorrhœa. *Allg. Wien. med. Zeitung*, No. 15-18. In the beginning of blennorrhœa Stellwag prescribes cold applications, frequently changed; bleeding is unnecessary, as well as scarification and canthoplasty. Internal remedies are of no use. When the inflammation has reached its height, the lids should be touched once or twice daily with a 2-3% solution of nitrate of silver. The eye is washed out every 3-4 hours with a 3% solution of permanganate of potassa.

203. LANGE. Iodoform in blennorrhœa neonatorum. *St. Petersburger med. Wochenschr.*, No. 10, p. 82. In 6 cases of blennorrhœa neonatorum (11 eyes) Lange dusted iodoform into the eye. After this had been done for 3 days, 3-4 times daily, granulations developed with small epithelial defects and opacities of the cornea. The eyes did not become better until the caustic treatment had been again adopted.

204. SCHIRMER. Blennorrhœa neonatorum. *Centralbl. f. Gynâcologie*, No. 14.

205. MÜLLER, FRANZ. Statistics of blennorrhœa neonatorum from the ophthalmic clinic of Greifswald University. *Inaug.-Dissert.*, 1882.

206. ABADIE. Traitement de la conjonctivite blennorrhagique. *Gaz. des hôp.*, 1882, No. 42. The author recommends a 3-4% solution of nitrate of silver, which should be applied as soon as possible and repeated every 12 hours, no matter whether or not the eschara has been cast off. The same treatment is still more urgently advised when the cornea is affected. V. MITTELSTÄDT.

207. PERRIN. Sur une forme de conjonctivite purulente rhumatismale. *Progr. méd.*, 1882, No. 47.

208. TWEEDY, J. The treatment of diphtheritic conjunctivitis by quinine solution. *The Lancet*, 1882, No. 1. Tweedy uses a 1% solution of quinine in diphtheritic conjunctivitis and has never seen any serious corneal damage.

NETTLESHIP.

209. TERSAN. Traitement de l'ophtalmie purulente. *Bull. de thérap.*, fasc. ix, p. 431. Tersan advises to cauterize with nitrate of silver 1:20, then

1:50, besides scarification and cold compresses with a 5% solution of carbolic acid.

210. BROUCHET. Note sur le traitement chirurgical de l'ophthalmie granuleuse. *Rec. d'ophth.*, 1882, No. 2, p. 68. Brouchet recommends the method which Galezowski has practised for 10 years in trachoma. He excises with a pair of scissors the whole cul-de-sac which is affected both above and below. He reports favorable (! ?) results.

211. HOCK. A case of ulceration of the conjunctiva. *Wiener med. Blätter*, 1882, No. 7. In a young man of 15, a ragged ulcer with a soft fundus covered with small nodules was found upon the conjunctiva of the upper lid. The lymphatic glands were swollen. No signs of syphilis.

212. WICHERKIEWICZ. Some reflections on so-called warts of the globe. *C. f. A.*, 1882, p. 13. Wicherkiewicz observed close to the sclero-corneal margin a clearly bounded, round, smooth, grayish-yellow, hard tumor, with two bristly hairs, which somewhat overlapped the conjunctiva; it was not movable upon the sclerotic, and the conjunctiva firmly adhered to it. It was 4 mm. broad and 2-3 mm. thick. After removal it was examined, and found to consist of connective tissue with interspersed elastic fibres. The tumor sprang from the sclera, and had developed within 4 weeks.

213. PFLÜGER. Verrucæ conjunctivæ. *Annual Report of the Clinic of Berne University for 1880.*, Berne, 1882, No. 17. Pflüger saw on the limbus conjunctivæ and the inner side of the upper lid 6-7 roundish tumors, 4-6 mm. in diameter and 0.5-1 mm. high. Each nodule was surrounded by a number of smaller ones. They were removed, but grew again.

214. PFLÜGER. Peculiar affection of the conjunctiva of the globe, with hemorrhages, neoplastic tissue, and superficial ulceration. *Ibid.*, p. 20. It was observed in a seamstress of 19. She was highly anæmic, her skin grayish-yellow, and there were pharyngitis and ozæna. The proliferating portions of the conjunctiva were removed together with the ulcerations. The course of healing was good. The microscopic examination showed the excised portions to consist of granulation tissue.

215. PFLÜGER. Epithelioma of the conjunctiva of the globe. *Ibid.*, p. 25. A man of 56 had a nodular excrescence upon the left eye, which extended from the centre of the cornea as far as the caruncle, and was firmly attached to the globe. The eye was enucleated. The tumor proved to be a cancer.

216. RÄHLMANN. On hyaline and amyloid degeneration of the conjunctiva of the globe. *Virchow's Arch.*, vol. lxxxvii, p. 325.

217. RÜBEL. The scrofulous affections of the conjunctiva and cornea, and their relation to the so-called scrofulous diathesis. *Centralbl. f. prakt. Augenheilk.*, 1882, p. 75. After compiling the cases of scrofulous affections of the conjunctiva and cornea treated in Hirschberg's clinic, the author comes to the conclusion that they are more frequently found combined with other visible symptoms of scrofula, as swelling of the glands, rhinitis, eczema, etc., than the non-scrofulous affections.

218. HORNER. Essential shrivelling of the conjunctiva. *Corr.-Bl. f. Schweizer Aerzte*, 1882, No. 1, p. 12. The disease is very rare; among 70,000

patients it was observed only 3 times. The prognosis is bad, even after operative treatment. Horner transplanted human conjunctiva, which checked the progress of the disease.

219. AMÉDÉE ROBIN. De la k ratite marginale phlyct nulaire. *Th se de Paris*, 1882.

220. DUJARDIN. K ratite infantile, injection hypodermique d'alcohol. *Bull. de th rap.*, 1882, No. 1, p. 26.

221. LEWKOWITSCH. Two cases of interstitial keratitis. *Zehender's Monatsbl.*, vol. xx, p. 12. In a case of gastritis, Lewkowitsch observed the occurrence of interstitial keratitis, which grew better or worse, according to the state of the former. Iodide of potash cured the whole affection. In another case, interstitial keratitis set in. Here a quotidian intermittent fever was followed by a chronic gastric catarrh.

222. PFL GER. Specific parenchymatous keratitis. *Ophthalmic Clinic of Berne University*. Rep. for 1880, Berne, 1882, p. 31. As soon as the most severe symptoms of irritation have disappeared, the author advises in specific parenchymatous keratitis the use of a vaseline-salve (0.5%) of the yellow oxide of mercury, gradually increasing its strength to 3%.

223. COLSMANN. Case of recurrent affection of the cornea in gonorrh ic arthritis. *Berl. klin. Wochenschr.*, No. 16. Colsmann observed in a gentleman who was troubled several times with affections of the joints after gonorrh ea, the appearance of recurrent keratitis.

224. CHEATHAM, W. Inoculation for pannus, with a case. *Amer. Practitioner*, Feb., 1882. The inoculation was made of pure gonorrh eal matter. Before treatment there was but little more than perception of light; after the inflammation had subsided $V = \frac{10}{100}$. BURNETT.

225. ARMAIGNAC. Quelques consid rations sur l' tiologie et le traitement de l'ulc re serpigneux de la corn e. Observation. *Rev. d'ocul. du sud-ouest*, vol. iii, p. 1.

226. ABADIE. Des ulc res infectieux de la corn e et de leur traitement. *Ann. d'ocul.*, March-April, 1882, p. 143. The serpent ulcer of the cornea is doubtless of an infectious character. It is caused by the entrance of microorganisms into an eroded portion of the cornea. It is best treated by splitting it according to S misch, as compression and mortification of the corneal tissue, which gradually spreads, can be prevented by removing the exudation. Then eserine should be instilled and a light compressive bandage applied.

227. ARMAIGNAC. Erosion superficielle traumatique de la corn e chez un individu atteint de dacryocystite chronique. *Rev. d'ocul. du sud-ouest*, vol. ii, p. 6. The cornea of an individual suffering from chronic dacryocystitis was abraded, whereupon a serpent ulcer with hypopyon developed. Antiseptic treatment failed entirely; but recovery was rapid as soon as the ulcer was cauterized.

228. PFL GER. Traumatic herpes of the cornea. *Conf. f. c.*, p. 28. What Pfl ger understands by traumatic herpes of the cornea is an eruption of vesicles upon the cornea of elderly people. It has the appearance of ordinary herpes vesicles. All the patients had previously been operated. Pfl ger therefore thinks that the irritation due to the operation is a factor contributing to the development of the disease. The affection lasts from four to fourteen days.

229. MANDELSTAMM. Case of fistula of the cornea. *Centralblat. f. prakt. Augenheilk.*, 1882, p. 12. A lady of 25 had a central corneal fistula, in which lay a piece of iris. Mandelstamm made an incision at the corneal margin and removed the iris from the fistula. In a short time the anterior chamber was restored and the fistula had closed. A central corneal spot remained.

230. MAYERHAUSEN. The removal of foreign bodies from the cornea. *Centralbl. f. prakt. A.*, 1882, p. 48. Mayerhausen removed a foreign body 1.5 mm. long, which was completely embedded between the posterior layers of the cornea and had pierced Descemet's membrane, by enlarging the path of entry, inserting a cystitome under the foreign body, and thus extracted it.

231. HOBBS, C. M. Operative procedures in corneal lesions. *Trans. Iowa State Med. Soc.*, 1882, No. 2. A recommendation of iridectomy for bullous keratitis and synechiæ where the cornea is involved, and of peritomy and Sämisch's operation. BURNETT.

232. BELLOUARD. Kératite professionnelle. Incrustations plombiques de la cornée. *Arch. d'ophth.*, 1882, vol. ii, No. 1. Bellouard observed a fresh incrustation of the cornea with lead in two workmen engaged in the manufacture of acetate of lead, which was followed by severe inflammatory symptoms. In the one case phlyctenular keratitis, in the other a slight injury led to a partial loss of epithelium. In this way impregnation with the finely divided particles of the salt floating about was possible. v. MITTELSTÄDT.

233. KROLL. Contributions to the knowledge of neuro-paralytic keratitis. *Centralbl. f. prakt. Augenheilk.*, 1882, p. 72. Kroll observed in a woman left-sided herpes zoster, conjunctivitis, and opacity of the cornea. The perception of heat and cold was preserved in the affected parts, but perception of pressure and pain lost. There were also paresis of the abducens and considerable dilatation of the pupil. An ulcer developed upon the cornea, making necrosis probable. Iodoform dusted into the eye, combined with a bandage, gradually brought about recovery.

234. LITTLE, W. S. Kerato-malacia. *Phila. Med. Times*, April 22, 1882. The corneal sloughing in this case was symptomatic of brain-lesion with a neuro-paralytic condition of the fifth nerve. BURNETT.

235. BÖCKMANN, E. The nature and causes of the corneal affection accompanying anæsthesia of the trigeminus. Bergen, 1882, 163 pages. The author subdivides his treatise into two sections, an experimental and a clinical one. After viewing the most important contributions of others on this subject, he reports the results which he arrived at after about 100 experiments upon cats. In all essential points they agree with the investigations of Feuer, according to whom the corneal affection developing after intracranial division of the trigeminus must be explained as a xerosis of the cornea and a xerotic keratitis resulting from it. The author lays especial stress upon the importance of repeated and accurate tests of the sensibility of the eye and its adnexa, as in this way only it can be ascertained whether or not the trigeminus has been completely divided. In the clinical part Böckmann describes a xerosis of the cornea and xerotic keratitis which frequently occur among lepers. As these processes, according to the author, are synonymous with so-called neuro-paralytic keratitis, he believes, in opposition to Bull and Hansen, that the latter disease is not rare among lepers. BULL.

236. BLANCH. Périsclérite rhumatismale. *Rec d' oph.*, 1882, Nos. 2 and 3. Blanch reports a case of rheumatic periscleritis. It was cured in 6 days, by alternate instillations of atropine and eserine and internal treatment with quinine. MARCKWORT.

237. H. R. Massage oculaire. *Annal. de la soc. méd.-chir. de Liège*, March, 1882. The author discusses massage of the eye according to Pagenstecher's method, and recommends this method of treatment, especially in mild cases of phlyctenular conjunctivitis and in subconjunctival hemorrhage, which disappears more rapidly when thus treated; it is also useful in hypopyon and hyphæma. MARCKWORT.

C.—IRIS AND UVEAL TRACT, GLAUCOMA, SYMPATHETIC OPHTHALMIA, REFRACTIVE MEDIA (LENS AND VITREOUS BODY), RETINA AND FUNCTIONAL DISTURBANCES, OPTIC NERVE, INJURIES, FOREIGN BODIES (PARASITES), OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

BY DR. A. NIEDEN.

I.—IRIS AND UVEAL TRACT.

238. ALIA. De l'iritis séreuse et des phénomènes glaucomateux. *Thèse de Paris*, 1882.

239. BENSON. On coloboma of the choroid and the optic nerve sheath. *Dublin Journ. of Med. Sci.*, March, 1882, pp. 177-185.

240. COOMES, MARTIN F. Osseous degeneration of the eye. *Med. Herald*, March, 1882. The degeneration was the result of an inflammation of the uveal tract, occurring during childhood. The hyaloid and choroid were transformed into a bony shell, with an opening corresponding to the optic nerve entrance, with a diameter of $\frac{1}{10}$ of an inch. The anterior portion had points of chalk deposit. BURNETT.

241. DANESI. La sclero-coroidite. *Boll. d' ocul.*, No. 5, Gennaio.

242. DANESI. Un caso di sclero-coroidite anteriore con stafiloma terminato assai felicemente. *Boll. d' ocul.*, vol. iv, 8, p. 93.

243. FANO. Sur l' influence que la choroïde exerce sur l' acuité de la vision. *Gas. méd. de Paris*, No. 52. *Compt. rend. des sci.*, No. 23.

244. GOLDZIEHER. On disseminated choroiditis. *Wien. med. Bl.*, No. 10, p. 302, and *Pesth. med. chir. Presse*. Meeting of March 4. The author thinks that the genetic and anatomical relation between disseminated choroiditis and retinitis pigmentosa is closer than has heretofore been supposed to be the case, the latter affection being nothing else than a form of chronic plastic choroiditis. The pigment in retinitis pigmentosa originates in the choroid. See below, under vitreous body, No. 272.

245. V. HASNER. Case of primary sarcoma of the iris. *Prag. med. Wochenschr.*, No. 6, p. 58, 1882. The left eye, which was the affected one, had been injured 15 years ago, and after that slightly several times. The tumor had slowly developed in the upper-outer quadrant of the iris; its base extended from the periphery of the iris to the edge of the pupil. $V = \frac{1}{4}$. This reduction of the power of vision was probably due to secondary hyperæmia of the choroid and retina. Among 32 cases of sarcoma of the uveal tract, 2 cases only were confined to the iris.

246. KIPP, J. C. Two cases of sarcoma of the choroid presenting unusual clinical features. *Trans. Amer. Ophth. Soc.*, 1881. In both cases the tumor had grown to a considerable size without producing an increase of tension or total detachment of the retina. With the exception of these symptoms, both cases agree with the description of detachment of the choroid given in the text-books. BURNETT.

247. NETTLESHIP. Chorio-retinitis in inherited syphilis. *Ophth. Soc. of Great Britain. The Lancet*, No. 12.

248. RÉNÉ. Granulomes et gommès de l'iris. *Gaz. des hôp.*, No. 60, p. 500. Observed in 2 children with hereditary syphilis.

249. UHTHOFF. Congenital anomalies of the uveal tract. Statistics and cases. *Ann. Rep. of Schöler's Ophthalmic Clinic* for 1881, p. 7. Peters, 1882. Case of fatal irido-choroiditis, with posterior circular synechiæ and extensive choroidal changes. *L. c.*, p. 13.

250. WOLFE, JR. Case of tubercle of the iris and ciliary body. *Brit. Med. Jour.*, March 4, 1882, p. 299. In a clinical lecture, Dr. Wolfe, of Glasgow, draws attention to an interesting case of tubercle of the iris and ciliary body, which occurred in an eye which had been injured a month previously by a blow. The microscopic examination was made by Professor Hirschberg and Dr. F. Krause. Eight months later patient returned with ulceration of both legs and induration at the margin of both tibiæ. FITZGERALD.

II.—GLAUCOMA.

251. AGNEW, C. R, and WEBSTER, D. Report of some cases of glaucoma in which an iridectomy on one eye seemed to precipitate an attack of acute glaucoma of the other. *Med. News*, vol. xi, No. 8, Feb. 25th, No. 476.

252. HEYL, ALBERT G. Acute glaucoma caused by duboisia. *Amer. Jour. Med. Sci.*, April, 1882. The patient, a woman of 55 years, was already suffering from a simple glaucoma. A $\frac{1}{2}$ per cent. solution of duboisia was instilled for dilatation of the pupil for ophthalmoscopic examination. Subacute inflammatory glaucoma developed in the course of a few hours, for which an iridectomy was done with a happy result. BURNETT.

253. MAUTHNER. The excavations of the optic nerve. *Wien. med. Bl.*, No. 10, p. 300. In this paper the author declares in favor of the theory that glaucoma is a form of serous choroiditis. It is this and not the increased intra-ocular pressure which destroys sight, those cases being known to be the worst in which $T = n$. Choroiditis is the primary affection, the increased pressure only a secondary symptom.

254. PRIESTLEY SMITH. The action of atropine and eserine in glaucoma. *Ophth. Rev.*, vol. i, Nos. 4 and 5, Feb. and Mar., 1882, pp. 75 and 113. The author's object is to point out, as far as may be, on the evidence of pathological and clinical observation, what are the particular changes which atropine and eserine are competent to effect in the glaucomatous eye, and what are the indications for their employment and avoidance. These drugs exert very little influence on the tension of the healthy eye, therefore their marked action in glaucoma must be due to abnormality in the glaucomatous eye. This, S. believes, lies in the mechanical relations of the iris, and he thinks it can be shown that whenever a myotic or mydriatic raises or lowers the tension of the eye in any very marked degree, it does so by altering the position of the iris in such a manner as to hinder or promote the escape of the intra-ocular fluid. At the conclusion of the paper he sums up the rules concerning the use of eserine and atropine in glaucoma. FITZGERALD.

255. RHEINDORF. Case of glaucoma with acute opacity of the lens. *Zeh. klin. Monatsbl.*, vol. xx, 1882, p. 15. In a man with incipient senile cataract acute glaucoma of the left eye developed, which was followed at once by opacity of the lens. The author endeavors to assign the same cause to both affections. The more the zonula is stretched by the increased intra-ocular tension the less permeable it becomes. Thus the nutrition of the lens suffers, the consequence of which must be the rapid development of cataract.

256. WAGNER. Statistics of glaucoma (*Min. of the meetings of the med. soc. of Odessa*, 1881, No. 17). Confirms the observations of Benedict, Rosa, Arlt, Ridel, Schmidt, and Kranhals of the more frequent occurrence of glaucoma among the Jews, and seeks to explain it as a hereditary peculiarity of the race. HIRSCHMANN.

257. WATSON, SPENCER. Case of eyeball tension. *Brit. Med. Jour.* Mar. 11, 1882, p. 344. Mr. Spencer Watson reported a successful case of sclerotomy at the Clinical Society of London. O. D. operated on five years ago. O. S. operated on last year. Result not so good, but tolerably so. W. finds eserine very useful both before and after operation. Slight contraction of palmar fascia which W. had noticed in other glaucomatous cases, and was inclined to think that concurrence of the two conditions may possibly throw light on the pathology of glaucoma. He supposes that an atrophic hardening of the sclerotic coat of the same kind as the shrinking of the palmar fascia may be the initial stage of the disorder. FITZGERALD.

258. DE WECKER. La cicatrice à filtration. *Ann. d'ocul.*, Mar.-Apr. Wecker defends sclerotomy and attacks Schöler, who asserts, basing his opinion on his experiments on animals, that there is no such thing as a filtration scar. Schöler's experiments were made on healthy, not upon glaucomatous eyes; therefore the formation and effect of the scar in Schöler's experiments were essentially different from that forming after sclerotomy. Wecker proposes instead of the appellation Fontana's canal, rigole (gutter) of Fontana. *Vide Trans. Internat. Med. Congr.*, vol. viii, p. 100, and rep. in *Arch. f. Augenheilk.*, vol. xi, No. 1, p. 91. MARCKWORT.

259. WILLIAMS, C. A contribution as to the efficacy of eserine in glaucoma and analogous affections. *N. Y. Med. Record*, Mch. 25, 1882. W. reports three cases in which the use of eserine was a determining and essential

factor in the relief of glaucomatous symptoms. Case 1. Iritis plastica ; glaucoma consecutivum. 2. Injury with hæmophthalmus, dislocation of lens into vitreous, consecutive glaucoma. 3. Acute glaucoma in myopic eye. He has also observed a reduction of an abnormal tension in an eye suffering from congenital irideremia by means of eserine. BURNETT.

III.—SYMPATHETIC OPHTHALMIA.

260. BRIÈRE (Havre). Cataracte sénile, compliquée de synéchie totale et d'iritis sympathique. *Gaz. des hôp.*, Jan. 28, 1882. In a man of 56 there was closure of the pupil in the right eye after an unsuccessful cataract-extraction ; in the left, senile cataract, with total posterior synechiæ ; in both eyes cyclitis was shown to exist at corresponding points. Brière then performed an iridectomy upon the right eye, in order to see if this repeated operation would react unfavorably upon the other eye (!). Sympathetic ophthalmia set in, making the enucleation of the right eye necessary. Twice an iridectomy was performed upon the eye sympathetically affected, and the cataract extracted with a hook. There is no accurate report of the man's vision, it being only stated that he can neither read nor write. MARCKWORT.

IV.—LENS.

261. CRITCHETT. Practical remarks on cataract. *Ophth. Rev.*, vol. i, No. 4, Feb., 1882, p. 73, continued from p. 26. As regards an operation, the author advises not to operate upon the one until there is a marked diminution of sight in the other. But if symptoms of general constitutional degeneration are observed, it is advisable not to postpone the operation if the cataract is ripe, even though sight in the other eye may still be good, so that the chances of success later may not become worse, and safety be insured to the patients.

262. GALEZOWSKI. De l'influence des irites et des choroidites sur le développement des cataractes. *Rec. d'ophth.*, Feb., 1882. The lens is nourished from the aqueous humor. If disease of the uveal tract affects the latter, the nutrition of the lens suffers. Galezowski discusses the cataracts which result from this ; he calls them "choroiditic cataracts," and subdivides them into four classes : Choroiditic cataracts, more strictly speaking glaucomatous cataracts ; cataracts resulting from detachment of the retina ; and cataracts from retinitis pigmentosa, as the latter disease is only due to choroidal changes.

263. HARLAN, G. C. Two cases of congenital irideremia, with lamellar cataract in one and dislocated cataractous lenses in the other. *Boston Med. & Surg. Journ.*, April 20, 1882. BURNETT.

264. KNAPP, H. On the extraction of cataract. Clinical remarks made before the class of students at the N. Y. Ophth. and Aur. Inst. *N. Y. Med. Rec.*, Feb. 18, 1882. A synopsis of 30 successive extractions, with remarks on the operation in general. From this we learn that the operator has gradually abandoned the strictly linear incision of Graefe and now uses the small flap section of Wecker, with a large iridectomy. This latter, with special care as to the corners of the wound, Knapp thinks most important. He practised peripheral capsulotomy exclusively, different modifications of which are described,

and used antiseptic measures in every alternate case for the sake of testing its value. There was no failure in these 30 cases. For details as to his methods of operating see his various papers published in these ARCHIVES. BURNETT.

265. NOYES, H. D. The so-called cure of cataract by electricity. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. In a woman of 70, Noyes found incipient cataract, with slight changes in the choroid. V— $\frac{1}{10}$ and $\frac{2}{10}$. Twenty months later, during which she had ostensibly been cured by electricity, he examined her again and found extensive atrophy of the choroid. V— $\frac{1}{10}$ and $\frac{2}{10}$. It was evidently a case of subacute choroiditis, with peripheral opacity of the lens and slight opacities of the vitreous, which had disappeared under electric treatment and proper hygienic measures. BURNETT.

266. REYNOLDS, DUDLEY S. Cataract-extraction. *Med. Herald*, Feb., 1882. Reynolds reports 222 extractions, with a loss of 4 eyes. He employs a wide corneo-scleral section, a broad iridectomy, and a peripheral capsulotomy. This latter he reports as having recommended in 1876. BURNETT.

267. ROOSA, ST. JOHN. Cataract. The following cases occurred at the service of Dr. Roosa at the Manhattan Eye and Ear Hospital :

1. Senile cataract—inflammatory deposit in the pupil—corneal section-anæsthetics. Dr. R. does not open the eyes early after the operations.

2. Senile cataract—escape of the lens in its capsule—the flannel bandage. He regards the exclusion of all light from the room of patients operated on for cataract as not only useless but detrimental.

3. Senile cataract—delayed union of the corneal flap—secondary operation—failure.

4. Congenital cataract—good perception of light—needling—ability to recognize objects. The patient was 11 years old. He required to be taught how to see. He is learning the colors, and now recognizes black, white, blue, and red. It will be noted as an important fact that the colors which he first recognizes as distinct impressions are at the extremes of the spectrum.

5. Traumatic cataract—closed pupil—inflammation of the vitreous—Loring's method of iridectomy—restoration of vision. BURNETT.

268. THEORALD, SAMUEL. Report of a case in which useful vision was maintained through a number of years by the aid of a totally dislocated lens. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. The dislocation was probably congenital. The examination showed that the focal distance of the dislocated lens not only was much smaller than that of the relaxed lens in the diagrammatic eye, but even less than that of the accommodating lens. It can hardly be assumed that the power of this lens was equivalent to that of a normal lens just detached from the ciliary muscle. But the great convexity which it showed is of importance, and seems to be a further proof of the theory of Helmholtz in regard to accommodation.

269. UHTHOFF. Congenital affections of the lens. *Annual Report of Schöler's Ophthalmic Clinic* for 1881. Peters, Berlin, 1882. Cases and statistics, p. 7. Case of unilateral congenital (?) zonular cataract, p. 16.

270. ZEHENDER. Case of unilateral congenital zonular cataract. No defects of the bone. *Zeh. Monatsbl. f. klin. Augenheilk.*, vol. xx, p. 53.

V.—VITREOUS BODY.

271. GALEZOWSKI. Persistance des vaisseaux hyaloidiens. *Rec. d' ophth.*, March, 1882. Description of two cases of persistent hyaloid artery and vein, and one of persistent Cloquet's canal. In the former two cases there was posterior polar cataract. In the case of persistent Cloquet's canal a thread-like formation extended from a posterior polar cataract into the vitreous, widening gradually to such an extent as to cover the whole disc, forming a conical membrane with its base upon the disc and its apex at the posterior polar cataract.

MARCKWORT.

272. LITTLE, W. S. Remarks on persistent hyaloid artery. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. Two cases were observed. In the second case only the tissue of the artery was preserved; no blood in the capsular membrane, but there is a little pigmented tissue in the artery.

BURNETT.

273. GOLDZIEHER. The relation between opacities of the vitreous and the choroidal affection. *Pesth. med.-chir. Presse*, March 4, 1882. The vitreous body does not derive its nourishment from the chorio-capillaris, but from the ciliary body; more exactly, from the blood-vessels of the ciliary processes. Inflammations of the former membrane are therefore rarely attended by opacities of the vitreous; of the processes, almost always. In the serous form of choroiditis, which has its most characteristic exponent in specific choroiditis, dense and copious exudations into the vitreous are the rule. The blood-vessels nourishing the vitreous belong to the supra-choroid, and are surrounded by numerous nets of nerves and ganglion cells. The inflammatory process being conducted through these from the ciliary nerves explains the rapid and extensive nutritive disturbance of the vitreous, as it is observed in sympathetic ophthalmia, when it manifests itself early in the form of dense opacities of the vitreous.

VI.—RETINA AND FUNCTIONAL DISTURBANCES.

274. ANGELUCCI. Contribuzione allo studio dell' embolia dell' arteria centrale della retina. *Gaz. med. di Roma*, March, 1882. Embolism of both temporal branches of the central retinal artery. In the upper branch the embolus was situated at the first fork of the artery, close to the edge of the disc, in the lower a little farther down and beyond the beginning of the nasal branch. The amaurosis had been sudden, and included the whole field of vision except a small triangle outward. Two months later the two arteries could scarcely be traced beyond the emboli. The return of large hemorrhoids and hypertrophy of the left ventricle are assigned as the cause.

DANTONE.

275. ATKEN, CHAS. Neuro-retinitis from blow on forehead. *Brit. Med. Journal*, Feb. 4, 1882, p, 157. Patient was thrown out of trap, fell on right side, and was insensible for six hours. Had vomiting, epistaxis, and severe headache. On fourth day found he could not see with O. D., and was brought to Liverpool Eye Infirmary. He could not read Jaeger 20. Central vision and inner field quite lost. Optic disc and retina extending to outer margin of macula much swollen and of milk-white color, veins engorged, arteries partially hidden; macula blood-red, apparently enlarged and triangular in shape, apex

inward. No hemorrhages. O. S. normal. Ophthalmoscopic examination made four months later showed the optic nerve white—"remains of pigmental displacement" (sic),—arteries small, veins irregularly narrowed. Region of macula presented "washed-out-looking" patches on a deeper red ground. No perception of colors. Perception of light in outer field. No central vision. Muscles all acted normally. Pupil sluggish. Sensation normal. FITZGERALD.

276. BULLER, F. Case of sudden and complete loss of vision after large doses of quinine. *Trans. Amer. Ophth. Soc.*, 1881. These ARCH., vol. x, 3. In a healthy woman of 32, septicaemic symptoms developed 5 days after a normal delivery. Doses of 1.20 grms. of quinine were given three times daily. On the fifth day she was free from fever, but totally blind; the pupils did not react upon light; the retina was slightly turbid; four days later there was a slight return of vision. On the eighth day beginning atrophy of the optic nerve was observed. Eleven weeks later V = $\frac{1}{8}$, with a perceptibly contracted field of vision; at its centre only colors could be recognized. Two years later V = $\frac{1}{8}$, accommodation normal, but absolute peripheric color-blindness. Both optic nerves atrophic. Buller thinks this was a case of retrobulbar perineuritis, caused in some unexplained way by the use of quinine. BURNETT.

277. COUPLAND. Neuro-retinitis after contusion of brain. Ophth. Soc. of the United Kingd. *The Lancet*, No. 12, and *Ophth. Rev.*, vol. i, No. 6, p. 160.

278. DENISSENKO. On detachment of the retina. *Aerztl. Zeitung*, 1882, Nos. 1, 2, 3, 4, and 6. The author rejects the theories of Iwanoff, Klein, Jäger, Coccius, Adamük, and Rählmann in regard to detachment of the retina, especially that of traumatic origin; he and Schneller point out that these theories do not explain why and under what conditions traumatic detachment is easily cured in one case but remains incurable in the other; he discards entirely Schneller's conception of the lymph-currents in the retina. He admits that affections of the choroid may influence (though not primarily) the detachment of the retina, but maintains that in the retina itself all the conditions for the development and continuation of this pathological process are given.

Based upon his own histological investigations, Denissenko thus explains detachment of the retina. In chorio-retinitis (sometimes independently), atrophy of the rods and cones gradually sets in, extending from the outer to the inner parts and nuclei. Thus cavities are formed in the outer granular layer, which easily unite to form larger ones, and are only bounded by the limitans externa. An injury easily produces a rent in the latter; the lymph escapes from the cavities and penetrates between the retina and choroid, detaching the former. The hyperæmia increases the secretion of the lymph from the retina considerably and thus sustains the detachment.

The detachment is cured when the lymph is prevented from penetrating beneath the retina, either by adhesion of the rods and cones over the rent in the limitans externa, forming an isolated cavity, or by union between the retina and choroid around the rent, with formation of a cavity. The former event is so frequent in owls and horses that the author was at first inclined to consider it a normal condition.

The lymph causing the detachment generally comes from the retina, but sometimes from the choroid; in the latter case, however, detachment can only take place when the tension in the eye is negative.

The changes in the vitreous are only secondary results of the detachment of the retina. HIRSCHMANN.

279. DENISSENKO. A remarkable case of hemorrhage in the eye. *Wien. med. Presse*, No. 1, p. 14. The globe had been squeezed by an impinging piece of wood, producing dislocation of the lens. A peculiar red spot was discovered with the ophthalmoscope at a retinal blood-vessel, which became perceptibly paler when pressure was exerted upon the globe; the blood-vessel, whether artery or vein could not be determined, seemed to enter this spot. Diagnosis: Aneurism or varix of this blood-vessel.

280. DICKINSON, WM. Embolism of the central artery of the retina. *St. Louis Med. and Surg. Journ.*, Feb., 1882. Four cases are given in detail. In the second case, however, though there was sudden blindness, there is no account of the condition of the retinal vessels. In the others they presented the usual appearance in embolism of the central retinal artery. BURNETT.

281. EALES, HENRY (Birmingham). Primary retinal hemorrhage in young men. *Ophth. Rev.*, vol. i, No. 3, Jan., 1882, p. 41. In each case it was the left eye which was principally and chiefly affected. Vitreous opaque from hemorrhages into it. Often rapid diminution of opacity of vitreous, with a sudden recurrence after a few weeks or months. The hemorrhages in the retina usually almost entirely confined to periphery. Yellow spot not involved in any case. Ultimate result of these repeated extravasations was the formation of large whitish and sometimes glistening patches of degeneration at periphery of retina, with, occasionally, detachment of latter. In no case was retinitis seen to precede or accompany these hemorrhages. The exciting causes appear to have been: the recumbent posture, stooping, coughing, laughing, and especially over-exercise. All the patients were young. All were subject to epistaxis and suffered from constipation. Pulse habitually under 60 per minute. Urine normal. All complained of dyspepsia, low spirits, want of energy, and feeling of lassitude.

No evidence of gout in family. Puffiness and discoloration around the eyes noticed. Variations of local circulation were common *e. g.*, cold feet and flushings of the face. E., from the evidence of local variations of circulation, from the slow pulse, constipation, flushing of face, headache, and puffiness and discoloration around eyes, is inclined to attribute this combination of conditions to a neurosis affecting both the circulatory organs and the digestive system, leading on the one hand to partial inhibition of the muscular movements of the bowels and to a vaso-motor contraction of the vessels of the alimentary canal, with inhibition of its secretory functions, thereby causing dyspepsia, constipation, and malnutrition; and, on the other hand, to a compensatory dilatation of the systemic capillaries, especially those of the head, and, in these cases, of the retina, causing over-distention of the venous system and systemic capillaries, with liability to rupture on the occurrence of an intensifying cause. The slowing of the pulse he also considers due to a neurosis. He has tried various methods of treatment but without much success, so contents himself with treating the constipation with purgatives, and the dyspepsia with mineral acids combined with bitter tonics. Rest and change of air he has found of most benefit. He has met with no similar cases in females, and suggests that the menstrual function possibly acts as a safeguard. FITZGERALD.

282. GALEZOWSKI. Migraine ophthalmique avec thrombose des vaisseaux réiniens. *Rec. d'ophth.*, Jan., 1882; and ophthalmic migraine, an affection of the vaso-motor nerves of the retina and retinal centre which may end in a thrombosis. *The Lancet*, No. 5, 1882. Among the cases of ophthalmic migraine observed by Galezowski, thrombosis of the retinal blood-vessels was seen in two; in one, thrombosis with rupture of the retinal blood-vessels; in one, partial atrophy of the disc, which Galezowski is inclined to refer to thrombosis of the cerebral blood-vessels of the optic nerve. The clinical history of the four cases is reported, from which Galezowski concludes that occasionally ophthalmic migraine may produce palpable changes in the retinal and cerebral blood-vessels.

MARCKWORT.

283. HIRSCHBERG. On amblyopia from iodoform intoxication. *Sitzungsber. d. Berl. med. Ges.*, Mar. 15, 1882. *C. f. A.*, vol. vi, p. 93. In a young girl of 16, upon whom a resection of the hip-joint had been performed, and who had been treated for weeks with iodoform, a central scotoma was observed, the visual field being otherwise normal, and no ophthalmoscopic change visible. $V = \frac{1}{18}$. After removal of the bandage, V rose within 8 days to $\frac{1}{4}$.

284. MICKLE, W. JULIUS. Case showing the localization of the visual centres in the cerebral cortex. *Med. Times and Gazette*, Jan. 28, 1882. M., æt. 65, totally blind for many (probably more than 20) years from corneal disease, died of pleurisy, with erysipelas of the face, three months after onset of acute mental disease. Other special senses normal. *Post-mortem*.—Moderate general atrophy of brain-cortex. Well-marked atrophy of optic nerve and tract, and of upper part of supramarginal gyrus, and, to a less degree, of angular gyrus on both sides; patches of red softening, with dilatation and infarction of small vessels in 1st and 2d occipital convolutions on both sides. *The supramarginal wasting was the most marked*. Corpora geniculata, corpora striata, and optic thalami more or less wasted. The case shows, says M., that the cortical visual centres are not localized solely either in the anguli gyri or the occipital lobes.

E. NETTLESHIP.

285. DEL MONTE. Treatment of detachment of the retina. *Atti dell' ass. ottalm. ital.*, Sept., 1881. *Ann. d'ottalm.*, vol. x, 6. Artificial leeching is useless in old cases, in recent ones even injurious. The effects of injections of pilocarpine should not be overrated. In favorable cases the effect becomes apparent after the first injection.

DANTONE.

286. MORANO. Caso di distacco retinico. *Giorn. delle mal. degli occhi*, vol. v, Feb., 1882, and *Atti dell' ass. ottalm. ital.*, Sept., 1881. *Ann. d'ottalm.*, vol. x, 6. A detachment of the retina which had existed for 3 weeks was partially cured by the use of Heurteloup's artificial leech, Zittmann's decoction, and, later, calomel and opium.

DANTONE.

287. PONCET. Rétinite tabétique. *Compt. rend. hebd. des séances de la soc. de biol.*, No. 8.

288. ROOSA, D. B. ST. JOHN. Case of hemorrhage near the macula lutea, from concussion. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. A bullet had passed through the lachrymal sac, nose, and cheek into the region of the glenoid cavity. At the last examination there was only peripheric vision — $\frac{1}{100}$. The eye was myopic. Crossed diplopia. Roosa assumes con-

cussion of the retina, though it is doubtful whether the paresis of the oculomotor nerve can be assigned to the same cause. BURNETT.

289. SCHÖLER. Cases of hemianopic defects. *Annual Rep. of his Ophth. Clinic* for 1881, Peters, 1882, p. 30, ff. 1. Left-sided homonymous hemianopia from syphilis; partial recovery. Diagnosis: gumma between the chiasm and beginning of the optic nerve. 2. Heteronymous temporal hemianopia in a person of 25 with normal field of vision; without any apparent cause, only heredity; no cerebral symptoms. After the use of iodide of potash slight change in the boundary line of the visual field. Later, incipient atrophy of the optic nerve was observed. 3. Left-sided hemianopia in course of recovery; cause syphilis. Rapid improvement under inunction.

290. UHTHOFF. Congenital affections of the retina and optic nerve. *Ann. Rep. of Schöler's Ophth. Clinic* for 1881. Peters, 1882. Cases and statistics, p. 8.

291. WEINBERG (Hirschberg's clinic). On diathetic retinitis. *C. f. A.*, vol. vi, p. 65. 1. Retinitis in glycosuria and albuminuria. In two cases there were very characteristic changes in the fundus. No choked disc, numerous groups of shining white patches, though they did not show any stellate arrangement. 2. Retinitis from chronic lead-poisoning: *a*, in a type-moulder. Amblyopia of the right eye. Fingers counted at 8'. Normal field of vision in both eyes. The ophthalmoscope showed neuro-retinitis, numerous white punctiform spots in the retina, besides minute hemorrhages, perceptible thickening of the walls of the arteries. *b*, in a porcelain-glazer. Diffuse retinitis with central scotoma. Recovery.

292. WOOD-WHITE (Birmingham). Embolism of arteria centralis. Re-establishment of circulation witnessed with the ophthalmoscope. *Ophth. Rev.*, vol. 1, No. 3, Jan., 1882, p. 49. A young man, æt. 31, the morning of his visit to the hospital, perceived a cloud pass before his right eye, and in a few minutes the vision in this eye was totally lost. With the ophthalmoscope the fundus presented the characteristic appearances of embolism of the central artery. There was not the slightest perception of light. W. made pressure with his finger on the globe for the purpose of ascertaining whether there was any pulsation of the vessels, but without result. On repeating the pressure he was surprised to see the circulation suddenly re-established. The patient exclaimed that he could see. V— $\frac{2}{3}$. Field of vision slightly contracted in upper part. This continued. Two days later all œdema of retina had disappeared. V— $\frac{2}{3}$. No history of rheumatism, scarlatina, or syphilis. Cardiac examination showed marked impulse and slight systolic bruit at apex. W. thinks it was most probable that the embolus was lodged in the retinal artery at its point of bifurcation, and that not unlikely the pressure applied to the globe may have assisted in dislodging it, and that it passed forward to some peripheral portion of the retina. FITZGERALD.

VII.—OPTIC NERVE.

293. DRESCHFELD, J. Pathological contributions as to the course of the optic nerve fibres in the brain, *Brain*, vol. iv, 543, and vol. v, 118 (Jan. and April, 1882). 1, M., 40. L. hemiparesis, hemianæsthesia, and hemianopsia. Smell and taste normal. Fundus normal in each eye. Death, after occurrence of mental symptoms, 2 years from onset of symptoms. Diffused sarcomatous

tumor in posterior part of R. internal capsule, optic thalamus, lenticular nucleus, and anterior of the corpora quadrigemina; flattening and softening of R. optic tract, at base of brain, from pressure. D. records the case as strongly supporting the theory of partial decussation of the optic fibres at the chiasma. (The hemianopsia is stated to have been "exact and total" though "central vision is normal."—REV.) 2, F., 50. Sudden L. hemiplegia and hemianopsia, with slight hemianæsthesia; other special senses normal. Death from fresh apoplectic attack two weeks later. Small circular hemorrhage 8 mm. × 6 mm. in postero-upper part of R. optic thalamus ("the part described as the pulvinar"); rest of thalamus normal; corp. quadrigem., corp. geniculat., and optic tract normal. Several other localized hemorrhages in R. centrum ovale, accounting for the hemiplegia. Fresh hemorrhage under L. lobe of cerebellum, accounting for fatal attack. The pupils were normal to light; this, D. thinks, favors the view that the reflex centre for the iris is not situated either in the cortex or in the thalamus, but probably in the anterior corp. quadrigem. The hemianopsia did not reach quite so far as the fixation point. 3. M., 52. Chronic Bright's disease with neuro-retinitis. Sudden L. hemiplegia, hemianæsthesia, and hemianopsia (complete), with amblyopia due to changes visible in eyes. Subjective symptoms did not change during next 6 months, when he died of a second cerebral hemorrhage. Very extensive hemorrhage within R. hemisphere, destroying the basal ganglia, but the corpus geniculatum and optic tract perfectly healthy and at a distance from the hemorrhage. Cortex cerebri perfectly intact.

E. NETTLESHIP.

294. LAWFORD. Double optic neuritis following purpura. Ophth. Soc. of Great Britain. *The Lancet*, No. 4.

295. NETTLESHIP. Atrophy of optic disc after phlegmonic erysipelas of orbit. Ophth. Soc. of Great Britain, March 9, 1882. *Ophth. Rec.*, vol. i, No. 6, p. 157. *The Lancet*, No. 12.

296. TUCKWELL. Paralysis, probably syphilitic, affecting in rapid succession both arms; impaired vision; optic neuritis, gradual recovery under taking of large doses of iodide of potassium. *The Lancet*, 1882, No. 2.

297. TAY, WARREN. Double optic neuritis after injury of head. *Ophth. Rev.*, vol. i, No. 6, p. 159. *The Lancet*, No. 12.

298. WESTRUM. Observations of so-called choked disc in dogs. *Zeitschr. f. vergleich. Augenheilk.*, of Berlin and Eversbusch. Leipzig, Vogel, vol. i, p. 37. The ophthalmoscope showed the cause of amaurosis in two dogs, one of whom had probably become blind from quinine, to be choked disc in both eyes, presenting the same appearance as in man.

VIII.—INJURIES, FOREIGN BODIES (PARASITES).

299. LAMBERT, C. A. Injuries of the eye. *Chicago Med. Journ. & Exam.*, Feb., 1882. Traumatic aniridia, paralysis of all the muscles of the eye, and loss of vision; paralysis of all the muscles of the eye and lids, and some other less important cases.

BURNETT.

300. MANDELSTAMM, E. Injury of both eyes by a pistol-ball. *C. f. A.*, vol. vi, p. 9. It entered at the right temple, i. e., eyebrow, and passed out at the left temple near the beginning of the hair. Right side: ptosis, diminution

of mobility upward and outward, amaurosis; the ophthalmoscope showed detachment of the retina and rupture of the choroid above. Left side: no paralysis, detachment of the retina, also a rent in the choroid, and a smaller one below. Fingers counted at 8'. Total loss of the sense of smell.

301. MAYERSHAUSEN. Cases of visual disturbance after injuries of the skull. *C. f. A.*, vol. vi, p. 44. Fall upon the left supra-orbital region; unconsciousness, profuse epistaxis. Four weeks later atrophy of optic nerve, arteries much contracted, veins about normal, amblyopia, scotoma upward and outward. Diagnosis: fracture of the base of the skull affecting also the roof of the orbit resp. the optic canal; compression of the inner lower fibres of the optic nerve.

302. MENGIN (de Caen). Observations cliniques. *Rec. d' ophth.*, Jan., 1882. Reports two clinical cases: 1. Detachment of the whole lower half of the retina, due to an injury; complicated with a rent in the cornea, paralysis of accommodation, as well as the sphincter and pupil, and retinal hemorrhage. Recovery in two months. The author advises iridectomy in detachment of the retina from choroiditis in myopia. 2. Foreign body in the choroid, traumatic cataract; a reddish stone visible upon the choroid after extraction, and borne well; V — $\frac{1}{10}$; large scotoma corresponding to the foreign body.

MARCKWORT.

303. NICOLINI. Cecità immediata permanente unilaterale successiva a trauma diretto sul bulbo. *Ann. d' ottalm.*, vol. x, 6, p. 422. A girl of 22 struck her left eye against a projecting iron rod and lost her sight immediately after it. The pain was slight and the patient only had the feeling of pulsation in the eye. The following day the eye was examined, and a small ecchymosis found upon the nasal side of the upper lid and the corresponding spot on the globe, pupil immovable; otherwise every thing normal, including the interior; V — O. Five months later he saw the patient again; the optic nerve had become atrophic, otherwise nothing abnormal; V still — O. DANTONE.

304. OELLER. A splinter of wood. *C. f. A.*, vol. vi, p. 18. It was 8 mm. long, and had remained in the eye for 17½ years without causing any reaction, as it probably had lain parallel to the longitudinal axis of the globe, behind the upper edge of the external rectus; then in consequence of an inflammation it had placed itself at right angles to its former position, had penetrated the globe, produced irido-choroiditis, and was found when extracted 8-9 mm. behind the outer edge of the cornea, at the upper edge of the external rectus, perpendicular to the longitudinal axis of the globe. Preservation of the globe and some vision.

305. RAVÀ. Casuistica clinica. Pallino da caccia perduto nell' orbita, accenno oduna simpatica affezione. *Ann. d' ottalm.*, vol. x, 6. A grain of shot penetrated the globe 7 mm. from the upper inner edge of the cornea, passed out again 1 cm. farther back, and was lost in the orbit. After eight days vision had been totally destroyed; two weeks later symptoms of sympathetic irritation were observed in the other eye, which disappeared after enucleation; the scars of the entrance and exit of the grain were found in the enucleated eye, but the shot itself could not be found in the orbit. DANTONE.

IX.—OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

306. BEEROR. On conjugate lateral deviation of the eyes directly after epileptic fits. *Brit. Med. Journ.*, Jan. 21, 1882, p. 85. Dr. Beeror has observed this in eleven out of the last thirteen fits which he has witnessed. He thinks it may be explained by the theory, that the side on which there was the greater motor discharge, as shown by the initial rotation of the head, becomes at the end of the fit the more exhausted and suffers more paralysis than the other side.

FITZGERALD.

307. BUZZARD, J. On ophthalmoplegia externa, in conjunction with tabes dorsalis, with remarks on gastric crises. *Brain*, April, 1882, pp. 34–55. 1. F., 25, double ophthalmoplegia externa with partial mydriasis (pupils 4–5 mm.), gastric crises, paroxysmal limb-pains, absence of knee reflex, etc. Syphilis at æt. 17. 2. M., 36. Pains for five years. Decided tabetic symptoms six months; followed by ophthalmoplegia externa, quite complete; deafness and dysphagia. No optic atrophy. Death after attacks of dyspnoea. Neither of the sixth nerves nor L. third nerve could be found; other cranial nerves normal. Atrophy of nerve elements, with dilatation, plugging, and rupture of minute vessels, at nucleus of origin of 6th nerve. Advanced degenerative changes in posterior columns of cord. Nuclei of the bulbar nerves normal, (histological examination by Dr. Bevan Lewis). Comments on the cases.

E. NETTLESHIP.

308. CALMETTES, R. De l'ophtalmoscopie dans les maladies des oreilles. *Progr. méd.*, vol. iii, p. 44, 1882.

309. COHN, H. Ocular affections from masturbation. *A. f. A.*, vol. xi, 2, p. 198. He mentions, citing cases: 1. Photopsia, the eyes being otherwise normal. 2. Inflammations, resp. hyperæmia of the conjunctiva. 3. Blepharospasm. 4. Hyperæmia of the optic nerve. Also amblyopia, weakened power of accommodation, morbus Basedowii. (To appear in next number in these ARCHIVES.)

310. CONTI thinks he has observed a special form of iritis from malaria in himself and others. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d'ottalm.*, vol. x, 6.

DANTONE.

311. DRESCHFELD, J. Two cases of acute myelitis associated with optic neuritis. *Lancet*, January 7, 1882.

CASE 1.—F., 38, paraplegia of lower limbs and paresis of upper limbs coming on after exposure to cold. Double optic neuritis (without impairment of V) discovered three weeks after onset of symptoms. Other cerebral nerves normal. Death, from paralysis of diaphragm, 6 weeks after onset of symptoms. *Post-mortem*: Transverse myelitis for 1½ inches (3.5 cm.) in cervical region of cord; intense congestion of brain and its membranes. Serous fluid in the sub-vaginal space of optic nerve.

CASE 2.—M., 41, intemperate; probably had syphilis many years ago. *October*. Failure of V and weakness of legs; optic neuritis soon passing into atrophy and complete blindness. Complete paraplegia and varying mental condition with some delirium, passing into semi-coma. Extension of paralysis upward. Death 6 weeks after onset of symptoms. Patellar reflex, at first rather increased, entirely disappeared a few days before death. *Post-mortem*: Dis-

seminated acute myelitis, of different dates, in various parts, most intense in mid-dorsal and upper lumbar regions. Brain healthy. Careful microscopical examination.
E. NETTLESHIP.

312. ELY, E. T. Illustrative cases of disease of the eye, arising from affections of the teeth. *N. Y. Med. Record*, March 11, 1882. E. relates the following cases in which he believes the ocular troubles to depend on diseased teeth. Case 1. Paresis of orbicularis muscle, irregular spasm of ciliary muscle, monocular diplopia. Case 2. Paresis of R. int. rect. and ciliary muscles. Case 3. Partial paralysis of 3d nerve. Case 4. Inflammation of conjunctiva and sclera. In all these cases the eye troubles disappeared immediately on the correction of the dental difficulty.
BURNETT.

313. HORNER. Hereditary syphilis and its relation to ocular affections. *Corr.-Bl. f. Schweiz. Aerzte*, No. 3, 1882, p. 48. As results of it, clearly different from those due to scrofula, rhachitis, and tuberculosis, the following affections may be cited. 1. Diffuse interstitial keratitis, which may be considered a disease invading the source of nutrition of the cornea; it is frequently complicated with an affection of the uveal tract—the real seat of hereditary syphilis in the eye,—and of the vitreous. 2. Specific iritis and chorio-retinitis, the latter generally being confined to one eye. Horner also gives the statistics of some of the consequences of hereditary syphilis: 1, scars and eruptions in 27%; 2, dental affections in 20%; 3, periostitis in 27%; 4, glandular scars in 25%; 5, ozæna and lachrymal fistulas in 20%; 6, aural diseases in 12%; 7, affections of the gums in 10%; 8, prurigo in 8%.

314. HUTCHINSON, J. Case of anomalous nerve disorder in infancy. *Brit. Med. Jour.*, March 11, 1882, p. 342. Mr. Hutchinson exhibited this curious case at the Pathological Society of London, where he had already shown it seven years previously. One eye had been excised in infancy for supposed new growth, which, however, turned out to be an inflammatory material between the choroid and retina. Sight in other imperfect, with nystagmus. In his remarks H. mentioned having seen a child who, a few days after birth, was found in a condition of cold and shock; here paralysis, but not destructive lesions of both eyes followed. In another similar case he had seen symmetrical cataract occur.
FITZGERALD.

315. JANY, L. Case of right-sided hemianopsia and neuro-retinitis due to a gliosarcoma in the left occipital lobe. *A. f. A.*, vol. xi, 2, p. 190; 2 woodcuts. Girl of 21, who had suffered formerly from rheumatism of the joints, had been ill for 5 months with cerebral symptoms, but without any psychical disturbances. Choked disc in both eyes, loss of the right half of the visual field, but the boundary line does not lie exactly in the middle. No other symptoms of local lesion. Death during coma. *Post-mortem*: tumor in the region of the left lambdoid suture, projecting, exactly at the apex of the left cerebral lobe, extending forward as far as the sulcus parieto-occipitalis. Cystoid degeneration in the white substance of the posterior part of the parietal and occipital lobes. It proved to be a gliosarcoma. No other local lesions.

316. LANDESBURG, M. The eye and sexual excess. *Med. Bull.*, vol. xi, 1, p. 6.

317. LANGER (Duchek's clinic). Cases of cerebral tumors. *Wien. med. Presse*, No. 4, p. 116, and No. 6, p. 176. 1. Tumor of the pons Varolii in a

woman of 26. Cerebral and psychical disturbances, paresis of the left facial nerve, no fixation with the left eye, paresis of the left abducens, later also of the right internal rectus (associated paralysis). Choked disc in both eyes. Pupils equally wide; death during coma. 2. In a man of 41 suffering from headache, troubled speech, etc., impairment of sensibility of the right side of the body and of taste on that side. Paralysis of the right internal rectus and left external rectus. Right pupil wider than left. No visual disturbance or hemianopsia; ophthalmoscopic appearance normal. *Post-mortem*; tubercle the size of a hazel-nut in the right side of the pons.

318. LITTEN. The relation of diseases of the liver to retinal affections. *Sitzungsber. d. Ver. f. inn. Med.*, Feb. 20, 1882. *Deutsche med. Wochenschr.*, No. 13, p. 170.

319. MACKENZIE, STEPHEN. Headaches in children. *Brit. Med. Journ.*, Mar. 4, 1882, p. 307. In the discussion which followed on a paper by Dr. Day at the Harveian Society, Dr. Stephen Mackenzie drew attention to the importance of careful examination of the eyes in cases of headache in children.

FITZGERALD.

320. NETTLESHIP. Chorio-retinitis in inherited syphilis. *Ophth. Soc. of Gt. Britain. The Lancet*, No. 12.

321. NOTHNAGEL. Case of cerebral tumor. *Wien. med. Bl.*, 1882, No. 1. Tumor in the corpora quadrigemina of a girl of 22. The cerebral affection had lasted a year. Vision had first decreased in the right eye, then the left facial nerve had become paretic. Half a year later total amaurosis in the right eye, amaurotic amblyopia in the left. Neuro-retinitis in both eyes. Eyes movable downward only; impairment of sensibility in the left arm. *Post-mortem*: glioma of the corpora quadrigemina, a part of the base of the fourth ventricle, and the corpora restiformia.

322. ORSI. Exoftalmia doppia da meningite basilare exsudativa-suppurativa. *Gaz. med. ital. Lombard.*, No. 1. Gennaio, 1882.

323. PONCET. De l'état du nerf optique et de la rétine chez un ataxique aveugle depuis 18 ans. *Progr. méd.*, No. 8.

324. POSSADSKY. Pathological changes in the retina in some constitutional diseases. *Diss.*, St. Petersburg, 1882, 27 pages. The author reviews his pathological investigations as follows: 1. In all forms of typhoid fever there is hyperæmia of the retinal blood-vessels, and granular opacity of the 3d, 5th, 7th, and 9th retinal layers (of different intensity in the different kinds of fever). 2. In chronic pneumonia: hyperæmia, hypertrophy of the connective tissue, granular opacity of the 3d, 5th, and 7th layers, and occasional pigmentation of the stroma and the ganglion cells. 3. In croupous pneumonia: serous infiltration of various parts. 4. In peritonitis: hyperæmia, infiltration of the tissue with white blood-corpuscles, and opacity and swelling of the 3d, 5th, and 7th layers. 5 and 6. Meningitis and pyæmia: hyperæmia with extravasation, blood-corpuscles, infiltration of the tissue, opacity of the 3d, 5th, and 7th layers (less marked in pyæmia). 7. In uræmia: hyperæmia with extravasation, cellular infiltration of the tissue, slight haziness of the nervous elements. When the ureters were ligated: serous infiltration of the retina. 8. In chronic alcoholism: hyperæmia with extravasation and cellular infiltration, hypertrophy of the connective tissue,

coarse granular opacity of the 3d, and fine granular opacity of the 5th and 7th layers. 9. In jaundice from cirrhosis of the liver : hyperæmia, hypertrophy of the connective tissue, and fine granular opacity of 3d, 5th, 7th, and 9th layers. 10. In pleuritis with pericarditis : no changes in the retina.

325. SAUNDERS. Case of optic disturbance probably from intracranial tumor. *Brit. Med. Journ.*, Jan. 25, 1882, p. 116. O. D. Paralysis of 6th and paresis of 3d nerves. Argyll Robertson's symptom (contraction of pupil on convergence, but not on direct exposure to light) well marked. Optic neuritis, myopia. O. S. Paralysis of 3d ; hypermetropia. Author discusses Argyll Robertson's views, and concludes that the cause of the symptoms in this case was the existence of multiple tumors, probably syphilitic gummata, involving the nerves at the base of the brain. FITZGERALD.

326. VELARDI and RIBOZZI, who live and practise in malarious regions, have never observed ocular affections which could be brought into direct connection with the miasm. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. DANTONE.

SHORT REPORT ON THE 18TH ANNUAL MEETING
OF THE AMERICAN OPHTHALMOLOGICAL SO-
CIETY, HELD AT LAKE GEORGE ON JULY 26 AND
27, 1882.

By H. KNAPP.

Since the "systematic report on the progress of ophthalmology" has been so enlarged as to embrace the whole current ophthalmological literature, it would lead to repetition to publish, as heretofore, extensive reports of the sessions of the leading ophthalmological societies of this country and Europe. Short reports, however, may as items of news not be unwelcome to our readers, and from this point of view the subjoined is offered.

The meeting was called to order at 10 A.M. by the Chairman, Dr. H. D. Noyes, of New York.

Papers were read in the following order :

1. C. S. BULL, of New York. *A case of pulsating vascular tumor of the orbit, eyelids, and vicinity.* Repeated application of electrolysis checked only temporarily the growth of the tumor.

2. W. W. SEELY, of Cincinnati. *a. On a case of remains of hyaloid system, with attachment to the lens and detachment from the papilla. b. On a case of temporary loss of vision from serous effusion into the vitreous, probably due to malarial poisoning ; recovery.* He was positive that the effusion was not hemorrhagic

though an oculist who saw the patient first had said that the eye was full of blood. No kidney disease present.

3. R. J. MCKAY, of Wilmington, Del. *a. A case of disappearance of the iris after cataract-extraction. b. A case of non-pulsating exophthalmos with recurring thrombosis of the orbital veins.* The protrusion began in the right eye of a female patient at 10 years of age, increased slowly, was more marked during menstruation. After marriage and child-birth irido-choroiditis with sloughing of cornea set in; globe enucleated. The orbit was filled with a mass of veins, feeling like a varicocele. Threatening symptoms of purulent infection for some weeks; then disappeared. At subsequent menstrual periods repeated attacks of thrombosis in orbit. Finally complete recovery.

4. A paper by W. F. NORRIS, of Philadelphia, on *hereditary atrophy of optic disc*, was read by Dr. Harlan. Incident cases were reported in the discussion.

5. W. S. LITTLE, of Philadelphia. On *faradization in opacities of the vitreous*. Reports four cases, and speaks in favor of this mode of treatment.

6. C. S. MERRILL, of Albany. On *a case of retinal glioma in a patient of 21 years of age*. The microscopic examination of the removed eye showed simple glioma. No relapse these four years, but patient "now very low with phthisis, which began to develop about a year ago."

7. JOHN GREEN, of St. Louis. *a. A case of ruptured zonula with remaining accommodation. b. Enucleation with removal of tarsal cartilages and conjunctival sac.* Three such operations performed for epithelioma, two by himself, and one by A. Alt, of St. Louis. The whole conjunctiva was removed; the wound healed by granulation; the orbit was covered with skin, a linear cicatrix indicating the palpebral fissure. *c. Remarks on the operation for entropium*; gives details of his methods as described at previous meetings of this Society. Drs. Prout and Noyes speak in favor of the operation.

8. R. H. DERBY, of New York. *A case of anæsthesia of the retina with concentric limitation of the visual field in both eyes.* No change for two months under various treatment, but complete recovery in ten days after daily inhalations of three drops of nitrite of amyl. In the discussion the use of nitrite of amyl was spoken of by Harlan, Noyes, and Risley; results inconstant.

9. S. THEOBALD, of Baltimore. *a. A case of circumscribed*

defect of the lens, the remainder being normal in transparency. b. A fragment of glass in the eye, probably the ciliary body, for ten years, without producing serious consequences. Similar cases reported by Green, Pooley, Knapp, Noyes, and Kipp.

10. G. HAY, of Boston. A case of *extensive hemorrhage between sclerotic and choroid*. It simulated an intra-ocular tumor. The eye was removed and the error recognized. Dr. Knapp refers to a similar case, described in his "Intra-ocular tumors."

11. G. C. HARLAN, of Philadelphia, described a simple test for *simulated monocular blindness*. Let the patient read fine type near by through a strong convex lens placed before the good eye, then let him read large type at a distance without removing the glass. If he can read it, it must be with the other eye.

12. W. S. LITTLE, of Philadelphia. A case of *persistent hyaloid artery*.

13. F. BULLER, of Montreal, related a case of *peculiar alopecia ciliarum*, and demonstrated the cilia. Under the microscope a fungus-like substance was seen winding around the hairs like a cord, as a parasitic plant winds around a tree.

14. H. D. NOYES, of New York. *a. Aids in the removal of foreign bodies from the eye.* A $+ 2\frac{1}{2}$ " lens is held by a fork, the stem of which has a ring into which a finger of the hand holding the lids open is passed. This lens serves to illuminate the foreign body; another lens, fastened to a finger of the other hand, magnifies it. *b. Reduction of size and tension of eyeball by total evulsion of the iris and neurectomy.* *c.* Three cases of *tumor of the eye*.

15. H. KNAPP, of New York. On *metastatic choroiditis*. First reported the case of a girl who by exposure during her menstruation contracted metritis, transient irido-choroiditis of one and destructive purulent irido-choroiditis of the other eye. Then he spoke of the metastatic choroiditis in cerebro-spinal meningitis, and expressed his opinion that the fully developed cases of metastatic choroiditis always lead to the destruction of the eye, but that also milder cases occur in which the eye, with retention of good sight, is preserved.

16. GEO. C. HARLAN, of Philadelphia. *Case of sarcoma of the lachrymal gland; exophthalmus, extirpation of growth, preservation of eye.* Microscopic examination showed the tumor to be a spindle-celled sarcoma. In the discussion, Dr. Knapp observed that he had recently removed a similar tumor of the lach-

rymal gland, which—different from all he had seen before—was likewise a sarcoma. Extirpation; healing *per primam*; preservation of globe and sight.

17. C. J. KIPP, of Newark, N. J. A case of *acute inflammatory glaucoma, followed by fatal cerebro-spinal meningitis*. Dr. K. thought that the glaucoma resulted from the cerebral disease.

18. S. B. ST. JOHN, of Hartford, Conn. *a.* A case of *glaucoma fulminans* in both eyes. The first eye iridectomized on the 3d day; outbreak of glaucoma in the other eye the second day after the operation. Eserine no benefit. Iridectomy 36 hours after the onset. Recovery in both. *b.* *Removal of a particle of iron from the lens by means of the magnet*. Three months after the injury the cataractous lens was extracted. After the section with a Graefe's knife, the point of a Grüning's magnet was introduced as far as to touch the superficially situated fragment of iron, and brought it out. The cataract was then removed in the usual manner.

After several papers had been read by title, the society adjourned, to meet again, under the presidency of Dr. H. D. Noyes, at the Kaaterskill House, in the Catskill Mountains, N. Y., on the third Wednesday of July, 1883.

MISCELLANEOUS NOTES.

Prof. Junge of St. Petersburg has resigned his position at the military academy in that city. Dr. Dobrowolski has been proposed as his successor.

Increased opportunities for the study of ophthalmology are offered by several newly organized post-graduate medical colleges, viz:

1. THE NEW YORK POST-GRADUATE MEDICAL SCHOOL. Dr. D. B. St. John Roosa, professor; Dr. Edward T. Ely, associate professor; and Dr. S. S. Burt, instructor of diseases of the eye.

2. THE COLLEGE FOR MEDICAL PRACTITIONERS OF ST. LOUIS, MO. Dr. Wm. Dickinson, professor of theoretical and practical ophthalmology.

3. POST-GRADUATE INSTRUCTION AT THE UNIVERSITY OF PENNSYLVANIA, Philadelphia. Ophthalmology, by Professor Norris and Dr. Risley.

ARCHIVES OF OPHTHALMOLOGY.

TUBERCULOSIS OF THE IRIS.

BY DR. H. RÜTER, OF BERLIN.

(With two wood-cuts.)

Translated by Dr. PORTER FARLEY, of Rochester, N. Y.

ON June 10, 1880, Martin Seppelt, æt. 2 years, appeared at Prof. Hirschberg's clinic.

History: Parents healthy. Of his five brothers and sisters, four were scrofulous. The patient himself had already twice been at the point of death. The second time was four weeks ago, and his sufferings were caused by cramps which lasted the entire day. At that time the mother had noticed a gray spot upon the left eye, "in the pupil," as she said. During the last eight days this spot had grown perceptibly.

The child is cheerful, although evidently in pain from the affection of the left eye. He has marked hydrocephalus. The right eye appears healthy and possesses normal vision. In the left eye there is a high degree of pericorneal injection. The lateral half of the anterior chamber is filled with a cheesy mass, which is in contact with the posterior surface of the cornea. The cornea is transparent, but shows a newly developed blood-vessel. In the medial half of the iris gray miliary nodules are here and there visible to the naked eye. The pupil is closed by a thin exudation. Above, in the sclera, near the corneal margin, is a prominent yellowish-white nodule.

The diagnosis of tuberculosis iridis was made and enucleation determined upon; but at the entreaty of the mother the evacuation of the cheesy mass was first attempted June 11th. The patient was anæsthetized, and then a long lance-cut was made at

the corneal margin. A piece of the iris was drawn out and excised, but it was found impossible to evacuate the cheesy mass because, as from the first suspected, it was attached to the scleral nodule.

At first the wound healed well, but the cheesy mass still filled the anterior chamber as before, its bulk perhaps somewhat increased. Soon a mass of granulating tissue grew out of the wound. Accordingly on the 6th of July the enucleation which had been at first advised was undertaken. The wound healed in the usual manner.

On the 9th of September Prof. Hirschberg again had occasion to examine the child, and then learned that at least eight days previously he had suffered from epileptic spasms, which had continued from 5 to 9 o'clock in the evening. During the spasms he did not cry out as when first attacked. Three days after, he had become quite bright again, but retained the hemiplegia sinistra which had developed during the spasms. Examination showed that the child had no strength of grasp with the left hand; that it could not raise its left leg, while the functions of the right extremities were normal. The fundus of the right eye appeared to be normal, so far as the restlessness of the child permitted it to be seen.

The enucleated eyeball was preserved in Müller's fluid. For its examination a horizontal section was made.

Macroscopically examined, the following points were noted. The polar diameter of the eyeball measured 23 *mm.*, the equatorial diameter measured 21 *mm.* The shape was normal. Around the cornea the conjunctiva appeared changed. It formed a wall which presented a steep face on both its corneal and equatorial sides. The greater part of the anterior surface of the cornea appeared smooth; only on the lateral margin losses of tissue were noticed. Two of these spots were on the upper half of the eyeball, one of them close to the plane of section, the other a few millimetres from it. The last-mentioned defect is circular, and its periphery is marked by a fine white line. The whole cavity is filled with a yellowish-gray mass, which rises somewhat above the general surface of the eyeball. The larger defect, below the one, contains the same grayish substance with some projecting nodules.

Turning now to the cut surface as represented in fig. 1, it is first to be noticed that this represents the upper half of the eyeball.

FIG. 1.

N. nasal, *T.* temporal side. *R.d.V.* rest of anterior chamber. *I.* iris. *K.M.* cheesy substance. *d.C.* transparent, *s.C.* opaque cornea. *G.K.* granulation nodule. *P.c.* process ciliaris. *d.L.* transparent, *s.L.* opaque part of lens.

On the median side the cornea is normally continuous with the sclera, but on the temporal side it does not reach it. The intervening space, 3.3 *mm.* in width, contained the same grayish substance above described, which by this method of examination appeared to be a mushroom-like growth springing from the interior of the ball and spreading upon the neighboring sclera and cornea. Upon more minute examination still more of this substance is seen upon the cornea. Beginning at the median side the first fifth part of the cornea is normal. From this part toward the temporal side two layers can be distinctly recognized, an anterior transparent one which extends in uniform breadth from the nasal to the temporal side; and a posterior opaque one which appears like a deposit upon the cornea, and which increases in thickness as it approaches

the above-described opening, so that it finally covers the entire end surface of the cornea.

Only on the nasal side is there a slit-like trace of the anterior chamber, less than 1 *mm.* in breadth and 4 or 5 *mm.* in length. Elsewhere the space corresponding to the anterior chamber is filled, for the greater part, with a yellow, friable cheesy mass. A gray and more transparent portion extends over and into this cheesy mass, starting from the above-described granulation nodule. These cheesy masses are inseparably connected with the posterior surface of the cornea, and corresponding with this connection the lowest parts of the cornea are more opaque and gradually merge into the character of the granulation nodules.

The substance described as occupying the place of the anterior chamber rests immediately upon a stratum which, by its position and dark pigmentation, is recognized as the iris. The naked eye can perceive irregular processes of the black pigment extending into the region of the anterior chamber. The tissue of this pigmented layer appears remarkably soft, and increases in thickness noticeably toward the temporal side.

The ciliary muscle and processes present nothing remarkable.

The lens has a length of 8 *mm.*, and is greatly deformed. Its entire temporal half is flattened from behind forward. It appears to consist of two kinds of substance, of which that on the nasal side possesses normal transparency, while the compressed part on the temporal side is opaque and gray. The relatively normal part of the lens surrounds the opaque part like a cap, and there is a sharp line of demarcation between the two.

The choroid and retina present nothing remarkable.

As to the method of microscopic examination, it is to be remarked that the sections were first examined in glycerine. Preparations were then stained with hæmatoxyline, and then double-stained with hæmatoxyline and eosine. These last showed the tubercular structure particularly well, the tubercles taking a deep red and showing plainly under a low power in the surrounding blue-colored tissue.

The sclera under microscopic examination appeared normal. The wall-like tumor surrounding the cornea proved to belong to the conjunctiva bulbi, and to consist of an accumulation of round cells in its loose tissue. The epithelium covered this part and extended upon the cornea in a normal manner until near its lateral extremity, where round cells begin to penetrate between the epithelial cells, and further on become so numerous as to cover the latter.

Bowman's membrane, reckoning from the nasal side, is at first smooth and plainly to be recognized under the epithelium. Near the middle of the cornea it begins to shrivel into folds, but without showing any thickening. Under

FIG. 2.

G.K. granulation nodule. *N.* nasal, *T.* temporal side. *M.C.* musc. ciliaris. *C.* cornea. *K.M.* cheesy masses. *Tu.* tubercle. *Gs.* giant cell. *P.C.* proc. ciliar. *P.L.* pigment layer of iris.

each fold was an accumulation of round cells. In the lateral third this layer is no longer visible, although the epithelium can still be plainly recognized.

As to the cornea, the layers immediately beneath Bowman's membrane are much infiltrated with round cells, as before described, at first in clusters which raise the epithelium into folds. Toward the periphery these cells coalesce, forming a uniform layer. The middle layers of the cornea are the least altered, while the posterior ones show considerable infiltration, especially in the neighborhood of the numerous newly formed blood-vessels.

The membrane of Descemet, at the place where a trace

of the anterior chamber remains, shows no special changes. At the part where the cornea adheres to the substance which fills the anterior chamber, traces of the membrane of Descemet can be here and there recognized. For the most part, however, there is nothing to be seen of it, and the above-described infiltrated layers of the cornea pass directly into the tissue which fills the anterior chamber.

This mass in the anterior chamber is attached to the iris, of whose changed and swollen tissue it is principally composed. The iris is swollen to a thickness of from 2 to 2.5 *mm.* Its posterior pigmented layer is for the most part retained, and thereby the posterior boundary of the iris is sharply defined. Its anterior boundary extends forward on the one side to the above-named split-like trace of the anterior chamber; on the other side, to remnants of the membrane of Descemet, while in several places it passes directly into the infiltrated layers of the cornea. The substance of the iris consists essentially of tissue, very rich in cells, in which are embedded irregularly formed shreds of homogeneous, coarsely granulated substance. These shreds, as shown by all tests, consist of cheesy material. In the cell infiltration we recognize at first glance a great number of exceedingly characteristic spherical nodules, having a diameter of about 0.4 *mm.*; these consist of closely crowded nuclei and of great poly-nucleated giant cells, which lie in the middle of the nodules and present an irregularly spherical form. From most of these giant cells extend a number of processes which appear to pass into a net-work which envelops the entire nodule. In its meshes, next to the giant cells, lie large round cells, rich in protoplasm and having a large and distinct nucleus; nearer the surface there is a deposit of round lymphoid cells; and, finally, the entire ball is surrounded by pigment cells from the pigmented boundary layer of the iris. In short, we have here the histological tubercle as first described by E. Wagner ("Das tuberkel-ähnliche Lymphadenom," *Arch. f. Heilkunde*, 1870-71), and properly recognized by E. Schüppel ("Lymphdrüsentuberculose," 1871). These tubercles are destitute of vessels and are scattered quite regularly throughout the entire iris,

anterior to its vascular layer. The shreds and flakes of cheesy substance are deposited for the most part upon the numerous tubercles, and by far the greatest part of the iris consists of these tubercles and cheesy masses. Between them is a slight quantity of small-cell tissue, with embedded pigment cells—ordinary granulation tissue—well supplied with vessels. As already mentioned, the tubercle is very well shown by staining with eosine.

At several places between the cornea and the thickened tubercular iris is a small quantity of finely granulated substance—coagulated exudation.

In the uveal tract there is a change in the ciliary muscle which should be mentioned, though unimportant as compared with the condition of the iris; namely, a decided cellular infiltration, a sign of its participation in the disease.

The condition of the lens is to be noticed. Its capsule, which in other places is intact, is attached by nearly its entire anterior surface to the posterior wall of the iris. The clouding of the lower part of the lens is not caused by round-cell infiltration.

Surveying all these appearances we have here undoubtedly a tuberculosis iridis which, beginning in the miliary form, gradually developed into a tubercular infiltration of the whole iris, and also involved the corneal wound which had been made for its attempted cure. Thereupon there occurred cyclitis with anterior and posterior adhesions to the iris and partial clouding of the lens. In the other parts of the eye no pathological changes were seen.

Until recently ophthalmologists have differed greatly on the subject of tubercle. Although some of the older authorities recognize the occurrence of tubercle in the eye, the majority of ophthalmologists regarded the eye as exempt from this disease, until in 1858 the well-known case reported by Manz dispelled this illusion. Cohnheim and Busch quickly followed with descriptions of similar appearances found in the cadaver, and in 1868 Gräfe and Leber for the first time saw tubercle in the living eye. It is reported that E. Von Jäger on Jan. 10, 1855, recognized

tubercle ophthalmoscopically in the living eye, and that his diagnosis was verified *post-mortem*; also that he found tubercle in the eyes of four cadavers in cases not recognized during life. After the observations by Gräfe and Leber, reports of similar observations began to multiply, as appears by reference to the literature of the subject. But in all these cases the ophthalmoscopic appearances were of no importance to the ophthalmologist. Miliary tubercle of the choroid was a convenient auxiliary point in diagnosis, a recognition of which was of important service to other practitioners. In all these cases the affection of the eye was only an unimportant symptom of a general disease.

The labors of Schüppel, Köster, and Friedländer first proved that true tubercle sometimes occurs in a limited portion of the body without invasion of the entire organism, as in the granulations of fungoid inflammation of the joints, in scrofulous hypertrophied lymph-glands, in scrofulous abscesses of the skin, ulcers, caries, lupus, etc.; in short, that in nearly all so-called "scrofulously diseased" organs these malignant growths may occur. After this time diseased eyes began to be observed with reference to the presence in them of miliary tubercle, and soon cases of local tuberculosis became known.

Allow me here to describe several of these cases with which the one we are particularly considering possesses a common likeness.

The oldest of the cases is that reported by Gradenigo in 1869 (see literature). Perls quotes him, *Annal. d'oculistique*, 1870, vol. lxiv, p. 175 (*Archiv. f. Ophth.*, Bd. xix, 1, p. 122). This was the case of a man 21 years old who had on the right side slight conjunctival œdema with intense pericorneal injection, and round gray spots of pin-head size in the cornea, partly in its posterior layer and projecting into the anterior chamber. The iris presented slight diffuse discoloration, with six or seven round submiliary nodules, contracted pupil, and posterior adhesions. Hemorrhages occurred several times in the eyeball, and after some time similar nodules could be seen in the iris of the other eye, but unaccompanied by inflammatory symptoms. After

three months the opportunity for an autopsy occurred, which revealed general miliary tuberculosis with both old and recent tubercles. The nodules in the eye, according to Gradenigo's somewhat ambiguous description, possessed the characteristics of tuberculous formations, and there can be no doubt that this was a case of miliary tubercle of the iris.

The second case is that observed by Perls (*Archiv. f. Ophth.*, Bd. xix, 1, p. 221). Alfred K. was born of a healthy mother April 6, 1872. In 1865 the father had contracted syphilis and had undergone radical treatment. Later, in 1871, an infiltration appeared in the apex of his right lung, followed by formation of a cavity. Nevertheless, under suitable treatment he experienced continued improvement. The little boy during the first half year of his life suffered frequently from catarrh, which disappeared readily. It was often observed that the signs of congenital syphilis were absent. The child was strong and well nourished. On the 15th of Oct., 1872, Perls saw the boy suffering from an acute kerato-iritis. In the iris of the left eye was a slightly elevated, circumscribed nodule which he regarded as a gummy tumor. On consultation with Prof. Julius Jacobson it was determined to resort to the local use of atropine and the internal use of mercurials. In spite of all mercurials the condition of the eye grew worse, but the general condition of the child remained good. Gradually, however, the apex of the right lung became infiltrated, and the child became reduced by cough, loss of appetite, and slight fever. On Nov. 18th convulsions occurred, and they returned with short pauses. Death occurred Nov. 21st. The condition here found was that of disseminated miliary tuberculosis. "It is certain that in the examination of this case we have recognized a tuberculous cyclitis which, beginning in circumscribed nodules, progressed to suppuration, to corneal ulcer, and to tubercular infiltration of the entire iris and of a part of the ciliary body. It is well to mention that although such an affection of the iris is not frequent, still, when the attention has once been directed to its existence, more of such cases come to notice. As points in the differential diagnosis between iritis gummosa and tubercle in cases

such as this, where distinct nodules are not to be seen, may be mentioned the paucity of vessels in the infiltration, and the existence of the tubercular diathesis, and, particularly in children, the presence of cheesy degeneration of the lymph-glands."

Two years passed away before the publication of the third case. In 1875 Giulio Saltini published (*Annali d' ottalm.*, vol. iv, pp., 127-131), under the title "Un caso di neoplasia dell' iride," the following description of a case, the pathological anatomy of which was afterward accurately described by Manfredi. A girl, 16 years old, of a weak constitution, had complained for four weeks of slight dimness of vision and pain in her right eye. She had great congestion of the conjunctiva, and upon the inner part of the anterior surface of the iris was a round tumor as large as a moderate-sized pea, which extended outward to the margin of the pupil and inwardly was lost in the scleral boundary. Some blood-vessels could be seen upon its surface. The remainder of the iris was normal. Saltini mistook the condition at first for abscess, and attempted puncture. This, however, only caused the escape of some bloody serum without any collapse of the tumor. A week later its size had increased. It now covered three-fourths of the pupil, and greatly interfered with vision. Saltini then attempted to excise that part of the iris involved in the tumor, but again with no success, for during the next few weeks the tumor grew again and penetrated outward through the ciliary region, and enucleation of the eyeball was performed. Upon examination Manfredi found true tubercle of the iris. Subsequently he saw the patient again. She was strong and healthy, had no cough nor any symptoms of tuberculosis of the other organs. The wound of the operation was entirely healed.

In 1877 there appeared in *Arch. f. Ophth.*, Bd. xxiii, 4, p. 57, an exhaustive treatise by Weiss upon "Tubercle of the Eye." After relating three cases the author enters upon a discussion of the general subject of tuberculosis. His third case is of special significance to us. It is in brief as follows. On the 15th of April, 1876, Carl Seitz, a laborer,

51 years of age, was received in the Heidelberg Eye Clinic. In his right eye was lenticular cataract with considerable capsular cataract. Projection and perception of light were good. The patient had recently recovered from pneumonia; during this sickness he saw well, and only during the last fortnight had he noticed that his sight was poor in his left eye. The eye watered and pained him. The patient bound raw flesh upon it, and under this treatment there had developed numerous small corneal ulcers, mostly in the periphery. But aside from the ulcerated spots, the general surface of the cornea was not smooth. It appeared stippled. The iris was discolored. After the repeated use of atropine the contracted pupil was not widely dilated. The iritis might have been consecutive to the improper treatment of the keratitis. The great cloudiness of the vitreous, however, suggested some deep-seated disease of the eye. Under proper treatment the corneal ulcers cleared up, but the pupil remained contracted.

On the 27th of April a yellowish nodule could be seen upon the upper-outward portion of the iris. Upon the possibility of syphilitic disease being present, treatment by inunction was begun. Under this treatment, however, more similar nodules appeared, and the diagnosis of syphilis was abandoned. Tuberculosis of the eye was now suspected, but this diagnosis was rejected because no signs of phthisis could be detected in the chest.

The diagnosis of "granuloma of the iris" was fixed upon.

Meanwhile new nodules continually appeared, accompanied by great ciliary congestion. Vision failed more and more. Severe pains soon occurred, which, on the 21st of June, necessitated the removal of the eyeball. Upon examination, well-characterized tubercles were found in all parts of the eye. "In the case last described we find histological tubercle in nearly every part of the eye. In no other part of the body could any tuberculous affection be detected. This must have been a case of primary tuberculosis of the eye, perhaps confined to that special locality."

Five months later there developed upon the upper jaw, at the site of the enucleated eye, a tumor, which after its re-

moval proved to be an enlarged lymph-gland containing cheesy matter and tubercles.

Each of the foregoing cases speaks for itself. The four clinical histories contain the entire pathology and therapeutics of tuberculosis of the eye, when it occurs as a local affection. In the first two cases the tubercular disease appears to have had its primary seat in the eyeball. They accordingly point out the way to a diagnosis, and show the course of the disease. The last two show the method and consequences of treatment.

The discussion of a similar case by the Société de Chirurgie on July 9, 1879, is exceedingly interesting in this connection. On account of its great importance I here quote it from the *Centralbl. f. pr. Augenh.*, for July, 1879.

Dr. Anger related an observation made by Dr. Parinaud. The case was one of a 12-year-old child of phthisical parents, who had suffered from a discharge from the left ear. For five months past he had complained of increasing dimness of sight without his eye being at all painful (which eye was affected does not appear). Upon examination many changes were found. There was a whitish infiltration in the under part and in the posterior layers of the cornea. There was pus in the anterior chamber, but the iris could still be examined. Several tumors could be seen upon its anterior surface: one near the ciliary margin, the others near the pupil. They were four or five times as large as a pin head, were of a yellowish color, and projected into the anterior chamber. One of them has numerous small vessels on its surface, and from this one project small processes. Under these circumstances there could be no thought of syphilitic condyloma. Dr. Parinaud believed himself justified in the diagnosis of tubercular iritis. The eyeball was not very hard, but was red and probably diseased in its deeper parts. There was only slight perception of light. Dr. Parinaud sought in vain for tubercles in the fundus.

The general condition of the child was good. Dr. Parinaud asked the Society, first: whether this was a case of primary tubercle of the iris? and second, what was the proper treatment? Dr. Auger answered that it was un-

doubtedly a case of tubercle of the iris, five cases of which had been already published, and that the eyeball should be enucleated. He believed with Laennec and Virchow that it was possible for local tubercle to become general. If tubercle developed in an accessible position it should be removed. He had treated a patient with tubercle of the eye; the enucleation was not made, and the patient died after a few months.

Dr. Verneuil said: "I dissent from the views of Dr. Anger. I well know that on Virchow's authority the German surgeons wage a bitter war against tubercle. Cannot tubercle heal by calcification? Is it not seen that operations often cause death by hastening generalization? I beg the Society not to accept the positive conclusion of Dr. Anger."

Dr. Deprès said: "I have held that tubercle is at first a local disease, but that it develops into fatal pulmonary tuberculosis. But I by no means compare tubercle to a malignant tumor. Tuberculosis is a general disease extending more or less into the circulation. The surgeon who removes a tubercular deposit is in much the same position as if in a case of established purulent infection he were to operate at the point of primary infection."

Dr. Trélat said cancer may spread by continuity of tissue or by transportation—metastasis. The original deposit is the source of all the evil. If this is removed it is possible to check, if not to heal, the disease. But an individual who has tubercle anywhere is tuberculous. The tubercular diathesis is a general condition, the predominating factor in his organization. I would permit the removal of tubercular deposits only for the relief of local symptoms. After the operation the patient remains tuberculous as before.

Dr. Giraud-Teulon declined to enter upon the discussion of the general subject. He is, however, inclined to regard tubercle as similar to malignant tumors, and he advises enucleation.

Dr. Fort agrees with the views of Dr. Trélat: "Cancer is originally local."

Dr. Tillaux was of the opinion that the case in question

was one of tubercle of the iris, and that enucleation was necessary, but only in order to avoid sympathetic disease.

Dr. Marc Sée admitted that tubercle is a constitutional disease, but he cited, in support of the German theory, the fact that when sputa from a phthisical patient are injected into a dog's joint, fungoid arthritis ensues, followed by death from general tuberculosis.

The last case which I find recorded is that of Dr. Samelsohn, reported at the session of the *Niederheinische Gesellschaft für Natur- und Heilkunde* in Bonn, December, 1878. In point of time this case was reported before the one which I have just referred to, but for two reasons I have left it to the last. First, it clearly shows how by careful observation of the course of the disease in the eye alone, without perceptible tubercular disease in any other organ, a diagnosis may be made with reasonable certainty; and second, because this is the first case in which the diagnosis of "tuberculosis oculi" was confirmed by inoculation of a rabbit, which, according to Cohnheim, is the only reliable proof of tubercular disease.

Dr. Samelsohn presented a girl, 17 years old, with a tumor in the anterior chamber of the right eye, which he explained to be a tubercle of the iris. He did not enter upon an exhaustive anatomical demonstration, but discussed only the clinical differential diagnosis of the case. Four weeks ago, without any marked inflammatory symptoms, there appeared in the anterior chamber of the right eye, upon the temporal side, a yellow nodule, which by its growth into the pupil reduced vision to only quantitative perception of light. But as the nodule also perforated the eyeball outward, the patient came to Samelsohn, who observed as follows. The right cornea was diffusely crowded especially on the temporal side, and there was some superficial vascularization; its surface was raised by a growth which had broken through from the anterior chamber at the corneo-scleral boundary and had pushed the conjunctiva before it. This growth was of a yellowish-white color, and presented in the anterior chamber the form of a triangle, whose apex reached the middle of the pupil in the horizontal meridian, and

whose base corresponded with about one third of the corneo-scleral margin on the temporal side. Two distinct layers could be distinguished in the growth, a white layer immediately upon the iris, and a mottled yellow one forming the superficial portion of the tumor. The tumor itself had no vessels except at the base, where they started from the iris and were lost after running a little way upon the surface of the growth. In that part which, by the presence of newly formed blood-vessels, was evidently iris tissue, there now appeared a little yellow-white nodule, which on the next day united with the principal mass. Shortly after new vessels sprouted from the iris, and again accompanied the development of a new nodule. This rôle was repeated four times in the course of a week, and Samelsohn demonstrated one of these newly developed nodules. While by the coalescence of these discrete nodules the tumor grew in a downward direction, the old mass was at the same time driven further forward, and at last broke through the conjunctiva. The iris was slightly discolored and was adherent to the lens in several places. The eyeball was soft. There was quantitative perception of light, with good projection. Small pieces of that part of the growth which projected from the eyeball showed upon microscopic examination small round cells and granular detritus. In this case the diagnosis could lie only between granuloma and tuberculosis of the iris, since for many reasons, but particularly by reason of locality and the manner of growth, gummy tumor was excluded. Notwithstanding the fact that the microscopic examination failed to reveal the presence of any of the elements characteristic of tubercle, especially of giant cells, the diagnosis of tubercle of the iris was made, based upon the progressive, nodulated nature of the growth, upon the distinction in color between its old and new portions, upon its rapid and painless development, and, especially, upon the presence of other tubercular symptoms in the patient. Upon the right side of the back and upon the skin of the right clavicular region were two ulcers, having all the signs of being tubercular in character. Prolonged expiration and catarrh were detected in the apex of

the right lung. Dulness on percussion was still absent. Samelsohn expected that medical treatment would prove useless, and intended to remove the eyeball; after which he promised to report further.

In the February number of the *Centralbl. f. pr. Augenh.*, 1880, is the continuation of this interesting case. At the session of the Ophthalmological Society in Heidelberg, Aug. 11 and 12, 1879, Dr. Samelsohn stated that the tumor continued steadily to grow by apposition, until finally it penetrated upward through the conjunctiva, and the eye was removed.

Before this operation little particles of the tumor, which were removed from the anterior chamber, were put into the eye of rabbit. They were completely absorbed, but tubercle of the iris did not follow.

Immediately after enucleation the eye was opened, and part of the granulation mass was placed in the eye of a rabbit. This experiment resulted in nothing. But upon a second and third trial, the inoculation was followed by positive results. In both these cases tubercles appeared upon the iris, and in one of them they soon spread throughout all the organs of the body with the exception of the lungs.

Samelsohn believed that this experiment had absolutely confirmed his diagnosis, although his microscopic examination of the cheesy mass had been fruitless.

The subject of tuberculosis of the eye is so directly dependent upon the subject of tuberculosis in general that it is necessary here to make a brief excursion into the region of general pathology. Samelsohn's case suggests the question: "What is the character of tubercle?" The founder of the present prevailing views concerning tubercle is Virchow. He asserts first that the essential feature of this disease consists in the presence of tubercles—those gray submiliary nodules which Laënnec had called attention to,—and not, as the latter had taught, in the cheesy substance occurring in connection with them. Furthermore, Virchow gave a definition of what he was willing to regard as tubercle, a definition which is accepted by all recent investigators of this subject. Virchow placed the tuberculous growths in

the class of "lymphatic granulation tumors" (Virchow, *Die krankhaften Geschwülste*, Bd. ii, p. 385 etc., 555 etc., Berlin, 1865). His definition was: "Tubercle is a small spherical growth always proceeding from connective tissue and consisting of small round cells closely crowded together. The life of this neoplasm is a limited one. A degeneration of its elements very soon begins, and always first in the middle of the spherule. In most cases the result is a cheesy deposit. Aside from this local character the neoplasm possesses another, which necessitates its classification among the malignant tumors, namely, a decided tendency to spread throughout the entire organism."

This definition has been developed in two different ways, microscopically and experimentally.

In the first place, Langhans found giant cells almost constantly present in tubercle. Virchow had occasionally observed their presence, but to Langhans belongs the credit of having recognized their presence as typical. Moreover, he pointed out the peculiar nature of the giant cells of tubercle as distinguished from those found elsewhere. Köster recognized the epitheloid character of the cells surrounding the multinuclear element, their richness in protoplasm, the large oval nucleus with its bright nucleolus. This proof of a definite organization of these neoplasms gave great precision to the above definition. The consequence was that tubercle began to be looked for in hitherto unsuspected localities. Köster found miliary tubercles in the granulations of fungoid arthritis (*Virchow's Archiv*, Bd. xlviii, p. 95); Schüppel, in the cheesy degenerated glands of scrofulous subjects ("Untersuchungen über Lymphdrüsentuberculose," 1871); Friedländer, in scrofulous abscesses and ulcers of the skin, and in caries, lupus, etc. ("Ueber locale Tuberculose," *Volkmann's Sammlung klinischer Vorträge*, No. 64). In short, the doctrine of local tuberculosis was established.

At about the same time that Virchow promulgated his views on miliary tuberculosis, Villemin published an important observation ("Études sur la tuberculose," Paris, 1868). He had discovered that tubercle could be communicated to

the lower animals, and especially to rabbits, by inoculation. By these experiments the significance of Virchow's definition was experimentally extended. Cohnheim was the principal investigator of this subject. Before I state his views, allow me to describe some experiments which are of great significance to ophthalmologists, and which are directly connected with our present subject.

On the 13th of July, 1877, at the session of the medical section of the Schlesische Gesellschaft für vaterländische Cultur, Prof. Cohnheim related some experiments which he, in conjunction with Dr. Salmonsens, of Copenhagen, had made in the artificial production of tuberculosis. Tubercular material was introduced into the anterior chamber of rabbits' eyes. There followed only a slight kerato-iritis, provided the material, when introduced, was not putrid. In a few days the eyes became clear and remained so for several weeks, and the general condition of the animal was unaffected. The particles which had been introduced grew constantly smaller, so that often only a trace of them remained. Suddenly there appears, one day, in the tissue of the iris one, or perhaps several bright gray nodules, scarcely visible to the naked eye, but very plainly seen through a lens. In the course of the next day they increase in size, become white in the centre, and project very evidently above the iris. Their number increases every day, so as in some cases to equal thirty or forty nodules in a single eye. The substance of the iris itself swells considerably and becomes very red. The eyes remain in this condition for a while; then hypopyon appears; there is developed a vascular keratitis, with successive keratomalacia, keratoconus, and keratoglobus, until after the course of about four weeks from the first eruption of the nodules the cornea becomes covered with a thick, opaque pannus.

Such is the usual course; but it sometimes happens that a severe iritis is the first symptom, and only some days later the tubercles can be for the first time detected in the inflamed iris tissue.

The most frequent time for the appearance of the above-described symptoms was the beginning of the fourth week

after inoculation. Gray and cheesy deposits from human subjects, chronic and acute miliary tubercles, cheesy particles from extirpated human scrofulous glands, material from tubercle artificially produced in guinea-pigs and rabbits, all proved effective; on the contrary, the cheesy degeneration of cancer, a piece of the still non-tuberculous muscle of a tubercular guinea-pig, simple lymphoma, and local arthritic tubercle, so far as yet observed, are ineffective.

The conclusions concerning tubercle which Cohnheim deduces from his numerous experiments are published in two of his works, viz.: "*Vorlesungen über allgem. Pathol.*," Bd. 1, page 607, 1877, and in an address dated Sept. 23, 1879, entitled "*Die Tuberculose vom Standpunkt der Infectiouslehre.*"

In the first-named work Cohnheim classifies tubercle in the same category with syphilis, glanders, lupus, leprosy, and, in accordance with Klebs (*Prag. Vierteljahrsschrift*, vol. cxxiv), calls this group "infection tumors." He accepts the doctrine of Villemin and Klebs as to the specific nature of the virus of tubercle. "That tubercle is a disease of infection; that the general disease of the organism is of equal importance with the anatomical recognition of the tubercles themselves; that the most-marked symptom of a constitutional disturbance is the fever which almost constantly accompanies tuberculosis" (page 611). Judged by this criterion local tubercle is not real tubercle; the nodules in the granular tissue of fungoid arthritis are only tuberculoid.

After Cohnheim had become satisfied that the tubercle which remains limited to a few organs is true tubercle in spite of the fact that there is no fever, he two years later, in the address above referred to, announced a new definition by which he endeavored to supplant Virchow's anatomical definition by an etiological one. He says: Every thing is tubercle which, when inoculated into an animal, will produce tubercle; and nothing is tubercle which, when so inoculated, will not produce tubercle."

Thus Laennec regarded the cheesy degeneration as characteristic of tubercle; Virchow so regarded the miliary

nodules; Köster, Schüppel, Wagner, and Friedländer emphasized the peculiar organization of these nodules, while Cohnheim added their inoculability.¹

In the foregoing discussion the anatomical standpoint has been adhered to. We have been satisfied to prove the existence of tubercles in the iris. Samelsohn has gone further, and by proving their inoculability, has demonstrated the existence of true tubercle of the eye.

In conclusion I wish to express my thanks to Prof. Hirschberg and to Dr. Friedländer for their kind assistance rendered in this work.

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¹Since the publication of this paper in the January number, 1881, of the German edition of these ARCHIVES, the important investigations of Dr. R. Koch, demonstrating "the presence of *characteristic bacteria* in all tissues that are the seat of morbid alterations by tubercles," have caused a universal sensation. Dr. Hugo Engel gives an excellent exposition of the subject, "almost a literal translation of Dr. Koch's lecture *on the etiology of tubercle*, delivered before the Berlin Physiol. Society on March 4, 1882," in the *Phila. Med. Times*, September 9, 1882, p. 843, etc.

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EYE-DISEASES FROM MASTURBATION.

BY PROF. HERMANN COHN, OF Breslau.

Translated by Dr. R. O. BORN, of New York.

THE notes which are furnished by the ophthalmological literature about the influence of excessive masturbation upon the visual organ, are very scant. Especially on this subject the most careful observers have been particularly sceptical, in order not to confound the *post hoc* with the *propter hoc*. The difficulty of obtaining accurate statements from the patient; the aversion of even older physicians to make the pertinent inquiries in young girls; the experience that patients in whom the physician suspects a connection between their eye-disease and onanism, be it conceded by the patient or not, do not return for treatment;—all these circumstances have probably been the cause that nothing has been published in regard to this question, whilst the connection between eye-diseases and all kinds of general diseases and habits have of late been a favorite field of study for the oculists.

I am fully aware of the difficulties of explaining the causal connection between onanism and eye-disease, and have no intention to enter upon theoretical discussions and suppositions. I shall only relate a series of observations which conform in so many points, that it would be difficult to deny the connection, especially since in some cases, after the discontinuance of the masturbation the morbid symptoms disappeared.

I.—Photopsia.

In the literature to which I have access, I find no mention of this difficulty in connection with masturbation. In my private practice I have observed 15 cases, a few of which I shall shortly relate.

CASE 1.—A moderately strong, pale young man, 24 years of age, has complained for some weeks from photopsiæ and a feeling of pressure upon the eyes. He can not endure reading longer than 20 minutes, and he has the sensation as if a brightly illuminated window was continually moving to and fro before his eyes. Emm. S=1. The eye otherwise normal. From the 13th to the 18th year he had been masturbating daily, sometimes three times. Pain in head and back ; spermatorrhœa and asomnia followed. I advised moderate normal sexual intercourse and a smoked glass, which immediately reduced the symptoms. In the course of a few weeks he lost his photopsies, the pollutions, and the feeling of pressure upon the eye. Nine months later, whilst he was engaged to be married, he had a relapse, from sexual excitement.

CASE 2.—Z., 31 years old, delicate, pale, had a very troublesome dazzling before his right eye, as if a bright figure was moving before this eye. S=1. H $\frac{1}{8}$ in the right, H $\frac{1}{4}$ in the left eye. He had been masturbating excessively from the 10th to the 18th year ; then married, had three children, but continued to masturbate. The dazzling was very annoying some months later ; nothing further known about the case.

CASE 3.—Franz P., a very healthy-looking, strong farmer, 29 years of age, complained for two years of continual photopsies which appeared either as snow-flakes or as transparent white circles, or as bright rings, the size of the pupil. The eyes normal. Emm. S=1. Masturbation up to his 20th year. No tabes. I treated him with baths, derivatives, and strychnine for 1½ years without any improvement. Also the blue glass was of no benefit.

CASE 4.—C. G., teacher, a healthy young man 23 years old, complains of photopsiæ, especially bright dots which move about, and the air between himself and the object appears to be continually trembling. M $\frac{1}{2}$ in either eye ; S=1. Small crescent ; interior of eye normal. Up to his 17th year he had daily been masturbating. Treatment with derivants, iodide of potassium, strychnine, was of no avail.

The history of the other cases is similar to those recited.

In girls it is obviously much more difficult to ascertain the facts. Yet I have the positive history of daily masturbation, continued for years, in three cases. One, a girl 15 years old, with $S=1$, Emm., and perfectly normal eyes, complained of continual dazzling before her eyes. A 27-year-old governess, Martha v. G., who for years had masturbated daily, most violently during her otherwise normal period, was troubled with white stars and bright red dots before her left eye. Clara P., a girl 16 years of age, had continued dazzling in bright light. Menstruation since her 12th year and quite regular. Her aunt states that the girl, in spite of all remonstrances, masturbates daily. $S=\frac{1}{2}$; the interior normal.

If we take the essential points of the above-related histories, we find *photopsiæ*, *subjective perceptions of light in young persons whose eyes showed a normal condition of the pupil, acuteness of sight tension, sense of space, light, and color, refractive media, optic nerve, and retina.*

A series of cases in which similar subjective perceptions of light were complicated with a high degree of myopia, small defects of the visual field, reduced color-sense, slight changes in the optic nerve or retina, have intentionally been omitted, although extensive masturbation had been acknowledged.

In the cases which I have related, the photopsiæ consisted in a dazzling, like an illuminated and moving window; or in a scintillation, as bright stars, wheels, flashes, circles, or dots, sometimes as snow-flakes and oscillating air.

In almost all the cases *both eyes* were affected, but in two (2 and 14) the white figures appeared on the temporal side of only *one eye*.

The dazzling was only once accompanied by a feeling of *pressure* in the eyeballs, but the photopsies led several times to real *photophobia*, and forced the patient to shut his eyes, especially when going from a dark into a bright room.

The photopsies were in many cases so troublesome that reading had to be interrupted after a shorter or longer period.

In the majority of cases the symptoms disappeared or were less marked in the *dark*; in all, except Nos. 2 and 14, they disappeared at once upon *closing the eyes*.

The *duration* of the photopsies varied between four weeks and several years; in one case they had lasted for twenty years.

The patients were mostly pale and delicate, only exceptionally robust, well nourished, and of healthy appearance (cases 3 and 4).

There was, in several cases, pain in the back, but no *tabes*. In one case the knee-reflex was not well marked, yet distinct; in the others it was always normal. But the greater number of patients complained of symptoms of *neurasthenia*, especially *asomnia* and *pollutions*.

The patients were between 15 and 30 years of age, mostly between 22 and 25; only one man was 36 years old.

They all confess to have masturbated for years, mostly several times daily; the majority from five to seven years, some ten, one even twenty-three years (Case 12), and two men had even continued after they had been married.

The acuteness of vision was never impaired.

The *smoked glasses*, which I prescribed, diminished the symptoms in many, but not in all cases.

The discontinuance of onanism and a moderate normal sexual intercourse produced in cases 1, 5, and 11 a complete cure. Case 1 had even a slight relapse upon repeated sexual excitement, which could not be satisfied.

It would be superfluous to make any conjectures as to the place in the brain, optic nerve, or retina where those photopsies are produced. Ophthalmoscopically nothing abnormal could be found, either in the retina or at the nerve-entrance. We know, however, that wherever on the long way from the eye to the centre of vision the irritation is felt, the *perceptions of light* will, according to the law of eccentric projection, be placed in the visual field. In this sense we might perhaps be entitled to speak of a *hyperæsthesia optici*; the cause of the irritation will probably lie in *the brain*.

II.—*Conjunctival Inflammations.*

I have found only one place in literature, in which a connection between persistent conjunctival inflammation and masturbation has been noted. Förster¹ says: "I can adduce a considerable number of cases of young persons, in whom masturbation has caused persistent and intractable conjunctival diseases which, under ordinary circumstances, are easily cured; they were very pronounced *hyperæmia, catarrhal inflammations, and trachomatous infiltrations* in persons between 12 and 20 years of age who had confessed that they had been masturbating, and which after months of treatment showed little or no improvement. The condition of the conjunctiva is analogous to the chronic catarrhal pharyngitis in persons with continued pollutions, which always relapses and cannot be completely cured."

Although I have not seen a large number of cases, yet I have six observations which completely confirm Förster's views.

Two cases were those of commercial travellers who when young had been masturbating, and who, after sexual excesses, noticed the following morning a redness of the conjunctiva and lid-margins, with a feeling of heat and pressure. How much excesses *in Baccho* may have contributed I am unable to say. Salves and eye-washes produced no benefit in either case.

The other cases showed hyperæmia of the conjunctiva, follicular and dry catarrh, which in three cases entirely disappeared when the daily masturbations were substituted by moderate sexual intercourse. One of these cases (5) had been treated by myself and several colleagues for five years with sulphate of copper in substance and different astringent solutions without any benefit.

III.—*Blepharospasm.*

It is well known that clonic lid-spasms are frequent in *chorea*, and even older observers, as Fautrel² and Wendt,³ lay especial stress upon the influence of excessive onanism

¹ Graefe-Saemisch: "Handbuch der Augenh.," vol. vii, p. 102.

² Sédillot's: *Journal général de méd.*, vol. 39, p. 319, 1810.

³ "Kinderkrankheiten," Breslau, 1835.

before puberty in producing chorea. Fautrel's patients were all onanists. Ziemssen,¹ however, remarks quite correctly that from the impossibility of obtaining reliable statistics, it will always remain difficult to regard it as the cause of or even as a predisposition to chorea.

In the ophthalmological literature I find only Michel's² statement: "Clonic spasms of the orbicularis muscle may be caused by continued work at near objects, especially by artificial illumination; the spasms are therefore produced by local exertion. *Excesses in Venere et Baccho*, and *great excitement* increase the predisposition."

I admit that in cases where a connection between the excessive masturbation and blepharospasm appeared quite probable, the counter-proof of ceasing of the spasm after the sexual function had been regulated, is wanting; they happened to be cases which I could not follow because they did not return after, or because of their confession. Yet I find so frequently, especially during the last years (formerly I did not pay sufficient attention to it), the note in my journal, "confesses excessive onanism," in cases of clonic blepharospasm (9-12 per thousand among about 30,000 patients), that I cannot deny the *probability* of a connection between the spasm and onanism. They were mostly boys or young men, from 8 to 20 years of age, who appeared delicate, and who had more or less frequent spasms of the lids. The spasm affected rarely one eye alone, and usually showed small fibrillar muscular contractions, but sometimes it appeared as a violent spasm of both eyelids. Points from which the spasm could be stopped by pressure, I have, just in these cases, never found. Some cases were associated with chorea minor, others with spasm of other facial muscles.

It is known that many causes may produce a reflex spasm of the lid. Broadbent³ saw, for instance, the spasm appear as soon as the patient made an attempt to speak. I myself saw, some years ago, a young student who from childhood had blepharospasm, but only when he was

¹ "Handbuch," vol. xii, 2, p. 441, 1877.

² Graefe-Saemisch: "Handbuch der Augenk.," vol. iv, p. 443.

³ *Med. Times and Gazette*, July 9, 1870.

spoken to, and whose eyes became filled with tears whenever he forcibly controlled the spasm. Since at present almost all cases of blepharospasm are attributed to reflex origin, why should not great sexual irritation produce spasms of the lids? Prof. Berger has of late years confirmed my supposition.

IV.—*Other Diseases from Masturbation Mentioned in Literature.*

Förster says : " Masturbation is also said to be the cause of *amblyopia*, but this is certainly a rare occurrence." In my case-book I find quite frequently noted in young amblyopic patients that they admit to have masturbated, but we have to be particularly careful in regard to the etiology in these cases. They were rarely emmetropes, mostly hyperopes, who often have a congenital one-sided or double amblyopia; or myopes of a high degree, in whom we often find a diminution of vision without marked changes in the background. These cases prove nothing definitively.

The same can be said of *hyperæmia optici*, which I have noted quite frequently in young persons, especially girls who had masturbated. The more thousands of normal eyes we examine with the ophthalmoscope, the more we find it difficult to define where a pathological hyperæmia begins, the physiological variations of the redness and distribution of blood-vessels of the nerve-entrance being very great. But apart from this slight hyperæmia I have often seen that real hyperæmia of the optic disc had been caused by the great exertion under the present system of school-education, which after 4–6 weeks' vacation has passed off entirely. It can hardly be determined in these cases how much had been due to overwork or masturbation. Mooren in his interesting paper, "*Disturbances of vision and uterine diseases*,"¹ gives a very graphic description of an affection of menstruating school-girls, which is accompanied with hyperæmia of the optic nerve, but with normal vision: "We sometimes notice a slight hyperæmia of the optic disc, but

¹ These ARCH., vol. xi, p. 281.

not sufficiently pronounced to lie beyond the limit of normal variations. The patients notice a feeling of heaviness, esp. in the frontal region. The symptoms, which ordinarily are quite bearable, become much more severe upon prolonged mental exertion, even without any strain of accommodation. The feeling of uneasiness may even be increased to nausea with drawing pain in the back of the head. The longer and more intense these symptoms are, the more difficulty they have in finding rest, being troubled by incessant imaginations and not having any refreshing sleep." I am surprised that Mooren, who is a most acute observer, has in his excellent description not pointed out the probability of a connection with masturbation. I have heard exactly the same complaints from girls with hyperæmia of the optic disc, who, as their mothers told me, were masturbating excessively.

But in the same paper Mooren, for the first time calls, attention to the connection between onanism and *weakness of accommodation*. Cases, as cited by him, are probably very rare. He says: "If the mere introduction of a vaginal speculum, as I have repeatedly observed, is, by the distention of the vaginal wall, sufficient to produce a transitory asthenopia in nervous persons, it is only a logical inference that prolonged masturbation will produce those symptoms in a much higher degree. Miss N., a robust-looking maid of 29 years of age, confessed that she had been masturbating since she was 15 years old. The *accommodative asthenopia* and the *sensitiveness to even moderate light* had from year to year become more troublesome. The small labia projected from the vulva like elongated cords; the unusually large clitoris formed the starting-point of those symptoms of irritation which would sometimes culminate in the most distressing dyspnœa, and I had to advise the amputation of that organ." In regard to a second case Mooren says: "A lady from South America, who, from the statement of her physician, had been masturbating from early youth, had such a degree of *hyperæsthesia*, that she could hardly bear the *lustre* of the eyes of other persons; the accommodation was at the same time so completely paralyzed (unfortunately

the age of the patient is not stated by Mooren), that for near vision convex 6 was required; there was, besides, great sensitiveness of the ciliary body, and some time previously objects had appeared to become more distant and smaller."

About *glaucoma* in onanism I find the following remark of Förster: "It is not only the weakened condition of the patients after febrile diseases, but also a faulty mode of living, as too early sexual excesses, etc., which lead to an outbreak of glaucoma." Förster mentions on the same occasion the case of a young man, 21 years of age, who confessed to have masturbated for years, and who, up to the time of the glaucomatous attack, had had a gonorrhœa which had caused him great anxiety, because he had to conceal it from his parents.

That *Basedow's disease* may also have some connection with excesses in *Venere*, is shown by the well-known case, described by both v. Graefe¹ and Förster,² of a young man who had wrestled with a girl for half an hour, but had not been able to overcome her energetic resistance. "He had over-exerted himself so much that he felt faint, and only recovered to a certain extent after taking several glasses of sherry. The palpitation which had appeared during the wrestling, remained; two days later he first noticed the protrusion of the eyeballs, which continually increased." After three weeks he showed a well-marked morbus Basedowii; pulse, 120, very strong heart-beat; moderate swelling and pulsation of the thyroid gland, and great protrusion of the eyeballs. Nine months later Förster found his condition unchanged. Sattler³ also mentions that sexual irritation by onanism is, in older literature (Brück, Bouillaud, and Geigel), alleged as one of the causes which may increase the predisposition to Basedow's disease.

V.—*Views of Neurologists about the Dangers of Onanism.*

From the preceding remarks we see that the observation of eye-diseases as a consequence of onanism and other

¹ *Berl. klin. Wochenschr.*, 1867, p. 320.

² Graefe-Saemisch: "Handbuch der Augenkrankh.," vol. vii, p. 97.

³ Graefe-Saemisch: "Handb. der Augenkrankh.," vol. vi, p. 976.

sexual excesses is of recent date; but the connection between onanism and cerebral, spinal, and other grave nervous diseases has long been known to the profession (and to the *laity*). Many of the older exaggerations have been properly refuted by more recent investigations, but some of the modern writers have fallen into the opposite extreme; for instance, Leyden,¹ who in the etiology of spinal diseases does not even mention sexual excesses. The most prominent neurologists, however, regard onanism, under certain circumstances, as a cause of psychical and somatic diseases, which must not be underrated; and it is important and not without value for the oculist, to learn the views of at least some of these men.

Griesinger² thinks that onanism is an important and frequent cause of *insanity*, and of psychical and physical degradation. He gives the following classical description: "The resistance against an overpowering impulse, yet always yielding to it; the secret conflict between shame, remorse, good intentions, and the irresistible impulse are, as many onanists confess, no doubt of greater importance than the direct somatic element. How much is due to either cause cannot be decided in the individual case; the effects of onanism appear to be the greater, the earlier in life the constitution is affected and the patient becomes anæmic, the more it is accompanied by painful reflections, and the more it causes local diseases of the genital organs. Where these three elements are wanting, masturbation will rarely have severe consequences."

In regard to the different forms of psychical affections, the following notes about hypochondria and brooding may not be without interest. Jolly³ supposes that the excesses in masturbation are a much more effective cause of hypochondria than those *per coitum*, "because the former excesses are generally greater"; and also because it is more difficult to resist them. Berger⁴ cites a case of brooding

¹ Erb: "Krankheiten der Rückenmarks." Ziemssen's "Handbuch," vol. xi, 2, p. 147.

² "Pathologie und Therapie der psychischen Krankheiten," 1861, p. 178.

³ Ziemssen's "Handbuch," vol. xii, 2, 1877, p. 618.

⁴ *Archiv für Psychiatrie*, vol. vi, p. 217.

observed by Griesinger, of an intelligent young merchant, 21 years old, who attributed his condition to excessive masturbation, practised from his tenth year; and another case, seen by himself, of a young man, 20 years old, who for years had had frequent nightly pollutions, generally three or four times a week, usually twice or three times in one night, and which resisted all modes of treatment.

Ziemssen (comp. above, blepharospasm), on the other hand, doubts a connection between chorea and onanism; and also Nothnagel, a connection between epilepsy and onanism. The older observers have been of the opinion that just the sexual excesses greatly contributed in causing epilepsy, and even thought that the coitus was a kind of epilepsy (*coitum parvam esse epilepsiam*); but Nothnagel has among all his epileptic patients seen only one case in which he could trace the origin of the disease to this vice. The rare occurrence of epilepsy compared with the frequent practice of masturbation is, according to Nothnagel, in itself sufficient proof. At the same time he says: "Yet the influences of onanism upon the nervous system are no doubt greater than even excessive normal intercourse." Berger's opinions are similar. A communication of A. Berger about the connection between writer's cramp and onanism is quite valuable. He says: "The influence of onanism is shown by the observation of two young persons, who, after having been absolutely unable to write, were completely cured after the cause had been removed; and this is so much the more important, as writer's cramp in the majority of cases is incurable."

In opposition to the general opinion of physicians and laymen, neither Berger¹ nor Eulenburg² are inclined to attribute a great influence to sexual excesses in causing *tabes*. Both authors think that colds, injuries, etc., are much more important causes, and that onanism is only a predisposing element. Remak also traced only one form of *tabes*, the cervical, to excesses in *Venere*. Erb, who directed his observations especially upon this point, found that sexual

¹ "Zur Aetiologie der *Tabes dorsalis*." *Breslauer Arztl. Zeitschr.*, 1879, No. 8.

² "Lehrb. d. Nervenkrankheiten," Berlin, 1878, vol. ii, p. 459.

excesses had a decided influence in causing numerous spinal affections, as has also been observed by Romberg, Hasse, Hammond, and others. Erb contends "that every excess of natural or unnatural gratification of the sexual appetite, when practised for a long time, in many persons, not in all, considerably affects the spinal medulla and predisposes to disease." He supposes that the great excitement and commotion of the whole nervous system, and especially of the spinal medulla, with every ejaculation, is more injurious than the relatively small loss of substance.

Also Erb admits that many exaggerations have been published of the effects of masturbation, which is generally held to be more dangerous than the natural coitus. "This," he says, "does not appear very probable. The effect upon the nervous system must, for the man, be essentially the same, whether the friction of the glans is produced in the vagina or in some other manner; the nervous excitement accompanying the ejaculation remains the same, and the nervous excitement in coition would rather be greater. But the frequently repeated irritations at an early age are certainly dangerous, and there is no doubt that the consciousness of doing wrong, the constant struggle between a too powerful impulse and the moral duty, affects and exhausts the nervous system. But only the excessive onanism is harmful. If moderately practised it does no more harm to the spinal marrow than natural coition."

Conclusions.—If we sum up what myself, other oculists, and the most eminent neurologists have observed, we arrive at the following deduction:

Onanism, when practised excessively, can produce persistent photopsiæ, conjunctival inflammation, blepharospasm, paresis of accommodation, insanity, hypochondria, brooding, writer's cramp, and tabes; but, be it well understood, only *excessive* onanism.

The question therefore is: *Where does the excess begin?* This question can, in a general way, not be answered at all. Erb,¹ in his excellent book rightly says: "Whilst for some the Lutheran 'Once or twice a week' is all they can accom-

¹ Ziemssen's "Handbuch," vol. xi, 2, p. 148.

plish, others may with impunity do 4, 6 and 10 times [how long? ED.] as much. This seems to depend upon congenital differences of the sexual power, as we find it also in animals, for instance in stallions." A general rule can therefore not be given.

On the other hand, onanism is a wide-spread evil. As experienced a neurologist as Berger says in his lectures: "Masturbation is so generally practised that among 100 young men (and girls!) 99 at times do it, and the hundredth, the pure man, as I am used to call him, does conceal the truth."

In the course of nearly twenty years I have obtained statements of boys from different schools that all their school-mates masturbate, and that, especially in the third and fourth classes, just at the time of puberty, it is practised most extensively.

Under these circumstances we might ask whether the present prudery of our pedagogues is warranted? Should we not also in this matter mind John Stuart Mill's words: "The diseases of society can, as little as the diseases of the body, be prevented or cured without discussing them openly." Are parents and teachers right in carefully avoiding to speak of onanism before their children, because the one or the other child thus far unfamiliar with it might be led to it? Should for one or two innocent children hundreds of onanists remain without intelligent advice? What can be done at school in this matter?

I answer the question from the recollections of my own school life. A very popular teacher had learned that the greater number of the boys in the junior class were masturbating very much. One day he gave us, to our great surprise and consternation, instead of a French lesson, a discourse on onanism. Properly avoiding every exaggeration, he described the bad results as to body and mind, admitted the difficulty of entirely resisting it, and in a friendly way advised, at least, moderation. I know from my school-fellows what an excellent effect this lecture had; masturbation did, of course, not cease at once, but it became less. The lecture had been instructive without causing hypochondria, as is generally done by popular treatises.

In which class the information should be given is difficult to say; the sophomore or junior class would probably be the most suitable.

That internal remedies do not lessen the impulse to masturbation, is established. Bromide of potassium, camphor, and lupuline have often been recommended and as often been pronounced useless. Cold sponge and sitz-baths, much active exercise and gymnastics, avoidance of erotic literature and erotic pictures, might be indicated; but youthful imagination and impulse will hardly be restrained by this. It is by no means proven that masturbation is less frequent in the country, where people are more fatigued by working in the open air, than in the city, where life is more easy and comfortable. Onanism among school-children in cities at the time of puberty is certainly promoted by the present mode of education, which, by the prolonged sitting posture, favors in an unjustifiable manner an increased flow of blood toward the sexual organs. Physicians and teachers would be the proper persons openly to discuss this question.

I hope that ophthalmology, which during the last ten years has given many useful hints in regard to school-hygiene, will also in the question of masturbation begin the contest with old prejudices.

Concerning adults, physicians seem to agree with Prof. Benedict, who says: "There is no better remedy for onanism than well-regulated natural coition." How to avoid the conflict between morality and natural inclinations is a question requiring the most careful discussion.

REMARKS ON 177 OPERATIONS FOR ENTROPION AND TRICHIASIS.

By F. C. HOTZ, M. D., CHICAGO, ILL.

THE author of a new operation or of a modification of an old method ought, after a few years, to give a candid report of his experience. If his operation has proven a success, the profession will readily adopt it; if a failure, it is no less important for the profession to know it. But sometimes we do not learn of the results because they have not been very brilliant. For fear, therefore, my silence might be misinterpreted, I wish to give a brief report of the results I attained in the past four years by the operation for entropion and trichiasis published in volume viii, No. 2 of these ARCHIVES. And at the same time I wish to supplement my former paper by a few remarks on the operation.

The essential features of my operation are these: The skin of the eyelid is incised transversely in the line of the upper border of the tarsus of the upper lid (or along the lower border of the tarsus of the lower lid); the muscular layer covering that border of the tarsus is excised (about 3 to 4 *mm.* in width); and the cutaneous edges of the incision are brought in close adaptation with the cartilage by sutures which are passed right through the border of the tarsus and the tarso-orbital fascia.

The success of the operation depends a great deal on the correct incision; it is, therefore, of paramount importance that the surgeon has a clear idea of this point. Now, I have several times seen my incision described as being made

2 *mm.* above the free border of the eyelid. Nothing could be more erroneous than this statement! Perhaps the error was caused by my saying (*l. c.*, p. 255): "I apply the point of a scalpel at a point 2 *mm.* above the inner canthus and draw a horizontal incision across the lid to a point 2 *mm.* above the external canthus." He, of course, who had read the preceding passages with attention, and only looked at the wood-cut accompanying the description, could never get so false a conception; for it was expressly remarked the incision should follow, as closely as possible, that furrow which is the border line between the skin of the eyelid and the supra-tarsal integument. This furrow (in the upper lid) describes a curve beginning 2 *mm.* above the inner canthus, and ending 2 *mm.* above the outer canthus, but its centre is from 6 to 8, and sometimes even 10 *mm.* removed from the cilia. But as the free mobility of the tarsal skin makes it exceedingly difficult to make the curved incision with the desired precision and nicety, I suggested temporarily to change the curve into a straight line: "I seize, between thumb and forefinger, or with a pair of forceps,¹ the centre of the free edge of the lid and draw it downward until the skin is moderately stretched. As both the commissures are fastened to the bones and thus rendered immobile, the centre of the lid alone is affected by this traction, the free edge obtains a convexity downward, while the curved furrow which marks the upper border of the cartilage is reduced to a straight horizontal line." In other words, the centre of the furrow and the centre of the ciliary edge are displaced downward at the same rate, their original distance being uninfluenced by the traction. Consequently, an incision which follows that furrow while temporarily drawn out to a horizontal line, begins and ends 2 *mm.* above the commissures, but its centre recedes from the lid border 6, 8, or 10 *mm.*, according to the varying width of the tarsus. This incision sacrifices nothing of the tarsal skin; the lid retains after the operation its original integument, and in consequence thereof its natural appearance and unimpeded movements, so that this operation, judged by its cosmetic effect, may be considered superior to all other procedures.

¹ If the eyelashes are too short to offer a good hold to the fingers.

Some surgeons, I have noticed, make the incision too near the cilia, because they seem still to believe the eversion of the inverted lid requires a strong traction, obtained from the forcibly stretched skin. I explained on former occasions why this opinion is wrong and should be dropped, and my numerous operations are the best practical evidence in support of my theory, that a very small force and a slight tension of the skin are sufficient for the cure of entropium, provided the tension proceed from a fixed point, such as the upper border of the tarsus offers.

When the skin of the eyelid is very flaccid and wrinkled, or when the excision of a wedge-shaped piece of cartilage is contemplated, whereby the width of the cartilage would be diminished, only in these cases may the incision be made below the oft-mentioned furrow to avoid having a superabundance of skin after the operation. But should the incision be made in the furrow and the tarsal skin afterward be found superabundant, the mistake can easily be rectified by the removal of a narrow strip of skin from the lower border of the wound. At all events, it is better to make a mistake in this rather than in the opposite direction; for if the tarsal skin turns out to be too wide, it can easily be shortened; but if too short, it cannot be lengthened. An evil consequence necessarily resulting from the short-cut skin is the great difficulty of uniting the edge of the tarsal skin with the upper border of the tarsus. Either it cannot be done at all, or only by unduly stretching the skin. In the first instance, the sutures cannot pass through the border of the tarsus at all; and in the second case, the tension being too great, they are likely to cut through prematurely, allowing the abnormally stretched piece of skin to recover its natural state, in which it is wholly insufficient to cover the whole surface of the lid and to unite with the upper border of the cartilage.

Only when the tarsal skin becomes firmly united with the border of the cartilage the permanent success of the operation is insured. In the highest degrees of entropium and trichiasis, with much contraction and incurvation of the tarsus, it is a common occurrence that the upper border is as much

curved in as the lower ; and the edge we see after removing the muscular layer is not the real upper line of the cartilage, but the angle of incurvation. In order to avoid mistaking the apparent for the real upper border, and to make sure that the sutures hold the real border, I have adopted the following plan: After the needle has been drawn through the cut edge of the tarsal skin, I prick it into the cartilage near its upper border, and with it lift the lid off from the eyeball far enough that I can push one prong of a finely-toothed forceps from above downward between the lid and eyeball, while the other prong passes down in front of the cartilage. In this way the upper border of the tarsal cartilage must get between the prongs of the forceps, which hold it so well that the needle can transfix it with the greatest precision and safety at the properly selected point. I have never seen any untoward symptoms arise from this manipulation.

Canthotomy and canthoplasty were often performed in connection with my operation, and in all cases presenting a thickened and contracted tarsus Streatfeild's grooving was combined with the operation. The splitting of the tarsal edge has been discarded as useless ; its immediate effect upon the position of the eyelashes is very nice, to be sure, and lasts about as long as the gap in the lid border. When the gap is filled with granulations, the inevitable contraction of the cicatricial tissues will do its work so thoroughly that the gap is contracted to a fine linear scar in the tarsal edge, and the eyelashes, yielding to this traction of the scar, begin to bend down again. The same objection applies to Ammon's and similar incisions made behind and parallel with the tarsal edge into the conjunctival surface of the lid.

And now a few words about the **results of my operations.** In the space of four years (Sept., 1878, to Oct., 1882) I have performed 177 operations for entropium and trichiasis, of which 142 were on the upper lid and 35 upon the lower lid. Among the cases there were all sorts and grades of inversion represented. Although I have kept a careful record of all the cases, noting the state of the lids before the opera-

tion, the healing process, the result at the time when the patients were discharged, as well as the condition of the lids at subsequent examinations (when such opportunity offered itself), I shall not annoy the readers by statistical tables, but content myself with saying that the results generally have been satisfactory in the highest degree, and that I value the operation the more the oftener I have performed it. Among all the 177 cases there was not one in which the operation failed directly. In several cases, I admit, the eyelashes were not everted as much as I expected after the sutures were tied; but upon re-opening the sutures—as I always did under these circumstances—I found the imperfect effect to be due to faulty application of one suture or the other. Either the thread had not passed through the border of the cartilage at all, or only so superficially that it cut through when the knot was tightened. The readjustment of the faulty sutures always had the desired effect upon the position of the cilia. “Haste makes waste” and is not compatible with my operation which will therefore not likely be a great success in the hands of those who can spare but five or ten minutes for a lid operation.

My tables record 12 relapses in 142 operations for entropium of the upper lids. In 3 of the 12 cases partial entropium had occurred near the canthus; these cases belong to the first stage of the operation, when I yet thought the cilia nearest to the canthus could be everted permanently, without the deep sutures, by the removal of small triangles of integument. Since I have dropped this procedure and employed the deep sutures alone, I have not seen a relapse of this kind.

Four other instances of relapse also belong to the initial period of this operation. The lids presented the highest degree of inversion, and very marked incurvation of the cartilage, for which at present I consider grooving an absolute necessity. For the sake of an experiment, however, I did not groove the cartilages of those lids, because I was curious to see how much my method alone, without the aid of other means, could achieve in these worst forms of entropium; and I was gratified to see that even under such

unfavorable circumstances, the eyelashes could be turned enough to clear the eyeball without one particle of skin having been excised; but the eversion of the tarsal edge was not complete so as to prevent a relapse. In repeating the operation the tarsi were grooved, and results obtained which two years later were still perfect.

The eighth case of relapse occurred in a patient suffering from inveterate lues (which fact was not known to us at the time of the operation); the wound healed very imperfectly, and re-opened after two weeks to reveal extensive ulceration, proceeding from the groove in the tarsus. Relapses 9 and 10 occurred in a young lady who returned to her home in Minnesota ten days after the operation. When she left, the lids were in very nice condition, but at home (possibly from the effects of the severe cold weather in January), the lids became swollen, painful, and extremely sensitive to cold air. This state lasted about four weeks, and when the patient came back to the city her eyelids were still very tender upon pressure and sensitive to cold. It seemed to me that an inflammation and softening of the tarsus had taken place, and that under these circumstances the tarsal edge had again yielded to the traction of the very atrophic conjunctiva. In two instances, finally, the retro-tarsal fold of the conjunctiva was obliterated, and the height of the cartilage reduced to five *mm.* by atrophy of the conjunctiva and cartilage. In such cases the prospect for permanent improvement is very dubious; the fornix being obliterated, the lid is tied down, as it were, to the eyeball, which drags it along in its rotation. This continuous dragging creates chronic irritation and inflammation of the tissues of the eyelid, and in this way leads to further shrinkage of the component parts of the lid.

This extreme shrinkage of conjunctiva and tarsus is a very important factor in the results of the operation upon the lower lid, and has rendered a permanent relief impossible in three cases. In two other cases, however, the relapse must be charged to a faulty application of the sutures. In repeating the operation, it was discovered that the tarsus was unusually broad, and its lower portion was strongly

bent inward, so much so, that the angle of the bend had been taken for the lower border of the cartilage, and the sutures been put in the wrong place.

As I could not examine every case at some later period, I can, of course, not claim that these seventeen cases represent the actual percentage of relapses; on the contrary, I have no doubt that their number is greater, because I have operated on other cases under the same conditions as those which were followed by relapses. I mentioned the above cases simply to point out some of the influences which can affect the result of the operation, and to show that some of the causes have no particular relation to the operation I employed, but will have the same bad effect upon the results of any other method. From my whole experience, I dare say that relapses will occur comparatively seldom, provided the operation be done with care and accuracy.

Among my cases there were fourteen upper eyelids upon which other operative methods had been tried for the relief of entropium. In the most cases Arlt's operation had been performed; and it was interesting to observe how seriously the movements of the upper eyelid are impeded by the removal of the tarsal skin, and that the degree of the disturbance stood in close relation to the size of the excised integument. In these cases we must take particular pains to make the incision in a line with the upper border of the tarsus, because after the transverse incision is made, the skin which was stretched and dragged out of place by the previous operation will shrink so much that there will not be enough to cover the whole lid with if the incision be made lower than the upper border of the tarsus. The skin must be dissected off from the tarsus clear down to the eyelashes by dividing all the cicatricial bands connecting the two parts; the cartilage being grooved, the sutures are put in. In this way I succeeded in relieving the entropium as well as in restoring to the eyelid its free and easy movements.

Operations for entropium producing perpendicular scars upon the eyelid are a gross offence against good taste and cosmetic laws, and the sooner they are excluded from the

sphere of legitimate surgery the better. Twice I had occasion, in operating for entropium, to relieve the lid of the hideous deformity produced by such perpendicular scars.

With a few exceptions, the after-treatment consisted in the application of wet compresses during the first twenty-four hours; in six cases, borated cotton was used instead. First union was obtained in 140 cases; in thirty-seven cases pus showed itself in the sutures on the second or third day. The constitutional condition of the patients seemed to influence the healing process more than any other cause; among forty-three patients whose constitution was weakened by scrofula, anæmia, malnutrition, etc., suppuration occurred twenty-four times, while among the 134 robust patients the healing was disturbed in seven cases only.

Reviewing the results of my operations after a four-years' trial, I can say that they have well sustained and corroborated my former statement, that this operation possesses the following advantages and meritorious features:

1. That it accomplishes its purpose (relief of entropium) without the slightest destruction of skin.

2. That for this reason it can be employed in cases where other methods are impracticable on account of excessive shortness of the integument of the lid.

3. That it does not mutilate the lid or in any way interfere with its movements.

4. That in a case of relapse it can be repeated without in the least disturbing the natural appearance of the lid.

5. That the tension by which the inverted eyelashes are turned back to their normal position is rendered independent of the movements of the lid, because the distance between the two points upon which the tension is to exert its influence, viz., the upper border of the tarsus and the free edge of the lid, remains the same whether the lid is raised or dropped; while where the entropium is relieved by the shortening of the integument, the tension is subjected to considerable variations, because it is regulated by the distance of the free edge of the lid from the supra-orbital margin. This distance varies with the movements of the eyelid: it is greatest when the lid is closed, and therefore in

this position of the lid the tension exerts its greatest influence upon the tarsal edge; but when the lid is raised, its free edge approaches the supra-orbital margin; consequently, the integument between these two points becomes relaxed, and the tension is greatly diminished, and may even be reduced to zero. Under these circumstances, therefore, the upper lid can appear everted when closed, and inverted when open.

December, 1882.

OBSERVATIONS ON DETACHMENT OF THE RETINA.

BY PROF. C. SCHWEIGGER, M.D., BERLIN.

Translated by ROSA WELT, M.D., New York, Clinical Assistant to the N. Y.
Ophthalmic and Aural Institute.

DESPITE the frequent occurrence of detachment of the retina, its mechanism is not sufficiently cleared up. It is essential to bear in mind that the primary stage of detachment is usually unaccompanied by changes of eye-ball tension. As much liquid as is found between choroid and retina is lost to the vitreous, and as quickly as the detachment extends, the vitreous will disappear; indeed, it disappears more rapidly. The theory of Heinrich Müller, that diminution of the vitreous is the cause of the detachment, is perfectly justifiable from an anatomico-physiological stand-point, and I have myself described a confirmatory case in *Gr. Arch.* (vol. ix, 1, p. 199). We must, however, consider some other possibilities.

The opinion of Leber,¹ that detachment is preceded by laceration of the retina, appears quite probable in many cases; yet I would not ascribe so great influence to shrinkage of the vitreous as Leber does in his paper. The retina may tear even if the vitreous is perfectly normal. The tightly-stretched retina of a myopic eye may rupture by slight external force, and the consequences manifest themselves only after some time, when the liquid, oozing slowly from the vitreous through the opening, has accumulated

¹ Transactions of the Heidelberg Ophthalmological Society, 1882.

in a sufficient quantity behind the retina to cause detachment, with its subjective and objective symptoms.

The tight and thinned retina of the myopic eye may tear even spontaneously. In the second edition of my text-book (1873) I have stated that ruptures of the retina are not infrequently noticed in recent cases of detachment, but if they are in the upper part they cannot be recognized when, by gravitation of the liquid, the lower part of the retina has become detached and the upper re-applied.

Ruptures of the retina are, therefore, more frequent than we can detect them, apart from the fact that it is difficult to recognize the majority of them on account of their peripheral situation. On the other hand, mistakes are possible, as depressed parts between the raised folds of the detached retina may be so close to the choroid that the red reflex of the fundus in these places may impose for a perforation of the retina.

The occurrence of ruptures by shrinkage of the vitreous, as Leber admits, is possible, of course, yet I have never been able to confirm it ophthalmoscopically; moreover, the edges of the perforation, with their tongue-like shreds, are always rolled outward, whereas a traction from the vitreous would roll them in the opposite direction.

It is probable that detachments occur in different ways. The differences in their course and termination very likely depend on the differences in the primary morbid processes. The final issue in irido-choroiditis is by no means so general as is usually supposed.

Be the pathogenesis of the detachment as it may, the greatest difficulty of explanation is always offered by those cases in which large detachments appear to have occurred suddenly.

It may, however, be that detachment does not extend in proportion to the disturbances of vision, which most alarm the patient. I have noticed, though rarely, detachment of the retina in patients who were not conscious of impaired vision. Nevertheless, it is possible that the detachment extends slowly until it becomes of a certain size and then suddenly impairs the vision, the liquid changing its location.

For instance, a temporal part of the retina, from the periphery to about 60° , could be detached without the patient noticing it, as this part of the retina is not very susceptible to light. It may also be that detachment occurs so often in myopia because the lesser resistance of the sclera might permit an accumulation of a very small exudation before a corresponding quantity of vitreous is absorbed. This process is a rapid one, as Donders has shown, and it may be repeated any number of times until a large exudation has accumulated.

The same difficulties encountered in endeavoring to explain the origin of detachment of the retina will be found in considering its therapeutics.

It is certain that, even if there were as much liquid in the vitreous as behind the retina, and though we could remove the exudation by a so-called antiphlogistic treatment, it must necessarily accumulate again if we cannot furnish the corresponding quantity of vitreous. If a pressure bandage at all assists the absorption of liquid, the result would be the same for the vitreous as for the detachment. Punction, it is true, has the advantage of removing a considerable quantity of the exudation; but as the liquid is removed by the elastic tension of the sclera, the former intra-ocular pressure is restored as soon as the scleral wound is healed, generally through a re-accumulation of the subretinal exudation; also, though exceptionally, through an effusion into the vitreous, accompanied by re-attachment of the retina. This is much more likely to occur in cases where punction is performed before the process of secretion is thrown into wrong channels. At all events, and provided the retina be not perforated spontaneously, I consider early punction in connection with a regular diaphoretic treatment the most rational course, and the chances of success the greater, the smaller the detachment. For several years I have preferred for the diaphoretic treatment sodium salicylate to pilocarpin, which produces many unpleasant symptoms. I give 2.00 grams in 0.5 doses every ten minutes, and have the patient wrapped in woollen blankets; the diaphoresis to be continued for several hours, during which the patient may take weak tea.

A reason which must induce us to continue the therapeutical experiments is the occurrence of spontaneous reattachment. These cases are, however, so rare that we are justified in communicating some such instances, especially if the cure was complete and lasting.

CASE 1.—Miss Schultze, twenty-eight years old, came under my treatment in January, 1874, on account of recently impaired vision in her left eye. No. IV. (Snellen) was read with difficulty at six inches. The field of vision was defective in the inner-upper part; distinct eccentric vision only in the external and superior parts. More than the lower half of the retina was found detached; the choroid scantily pigmented, and on the optic nerve there was a posterior ectasia. In the right eye, $M = \frac{1}{8}$; $V = \frac{1}{8}$; choroid also poorly pigmented and somewhat ectatic. As the patient was the daughter of a physician, there was no object in withholding the gloomy prognosis of this disease, and for that reason nothing was prescribed, excepting a mild laxative and foot-baths. Until April the patient was examined frequently, but no change was noticeable. In the following November she presented herself again, and was found to be very much improved. In the left eye V was then $= -\frac{1}{10} \div \frac{1}{8}$. No. II. (Snellen) was read at six or seven inches. The eccentric vision, however, was somewhat uncertain in and upward. The detachment had completely disappeared. A light gray band, corresponding to the upper boundary of the former detachment, narrow near the optic nerve, but expanding toward the periphery and dotted with dark pigment, started somewhat above the optic nerve and ran from here about horizontally toward the periphery. In its further course there were found on the outer-lower part of the choroid dark pigment spots extending over the space of about two diameters of the optic nerve.

The cure was permanent, and in April, 1880, when the patient last visited us, the vision in the left eye was $-\frac{1}{8} \div \frac{1}{8}$ to $\frac{1}{8}$. I repeat that, excepting the above-mentioned rather indifferent treatment, nothing was used. The patient had, without straining her eyes, attended to all her household duties.

CASE 2.—Mrs. C., fifty years old, came under my care in February, 1877, on account of impaired vision in the left eye, which had been noticed since November, 1876. Both eyes were highly myopic; $M = \frac{1}{32}$, $V = \frac{1}{8}$. With the left eye she could read No. III

(Snellen) fluently, but there was a defect in the upper part of the field of vision. Posterior ectasia was found in both eyes, slight in proportion to the myopia, as it extended only over about one half the diameter of an optic nerve. In the left eye the lower portion of the retina is detached, but shows very little discoloration; the exudation, therefore, probably was transparent. As the patient lived in a neighboring city, and could not remain under my care, only a mild laxative treatment was prescribed. In April, her condition was found unchanged. In May, 1878, there was no detachment whatever. All that had remained was a slight defect in the visual field between 30° and 40° which was otherwise normal. Even the prescribed laxative treatment had not been strictly followed, as the patient had travelled through Italy during May and June, 1877.

But not always does the re-attachment of the retina result in improvement of the vision. Of course the latter can only take place if the detachment was the only cause of impaired vision, and if the texture of the retina remained uninjured in the meanwhile. The detachment may disappear, though the retina be otherwise diseased.

CASE 3.—Mrs. L. began to be treated in October, 1874, for a detachment of retina extending over the lower half of the left eye; only No. XX (Snellen) could be read. The right eye was very myopic. With $-\frac{1}{4}$ V = $\frac{12}{100}$. No. $1\frac{1}{2}$ (Snellen) was read with difficulty at two inches. A large staphyloma posticum and choroiditis of the macula were found on ophthalmoscopic examination. The weakness and nervous condition of the patient prevented all energetic treatment; but in Feb., 1875, the detachment was found to be visibly diminished.

Four weeks later atropia was instilled, and then, upon examination, the retina was found completely re-attached. Besides a large irregular post. staphyloma of a diameter of 2–3 optic nerves, there were remains of choroiditis in the region of the macula, which appeared as light atrophic spots and some dark pigment spots; some pigment was also found on a retinal vessel. Similar changes were seen in the upper part of the choroid, which was otherwise normal; the vitreous contained some opacities. Central vision had become worse, and No. XX (Snellen) could not be read. A thorough examination of the visual field was impossible

on account of the patient's condition. An examination in April, 1881, gave the same result. The other (right) eye remained unchanged during this time.

CASE 4.—In August, 1875, the following case entered the department of eye diseases of the Charité, at that time under my management. Its detailed description was published by Dr. Herter in the *Charité-Annalen* (2 Jahrg. pag. 519), entitled: "Gravidität im 8ten Monat. Retinitis albuminurica mit Netzhautablösung beiderseits." When the patient was admitted the ophthalmoscopic examination showed a retin. albuminurica in both eyes. Retinal veins were enlarged and tortuous. Retina opaque, large shining patches reach to the papilla where they become confluent; toward the equator they appear as small, shining spots. In the region of the macula we find, toward the left, small transparent spots, and a slight hemorrhage toward the right. Throughout the other parts of the retina there were only occasional small band-like retinal hemorrhages; near the equator there were occasional isolated changes of the choroid, consisting in discoloration of the epithelium and accumulation of pigment. Finally, we found a very extensive detachment in the lower parts of both eyes. The detached retina was in some parts of a light gray color, in others as yet distinctly red. Floating movements were not noticed. The vision was very poor. The patient saw movements of the hand at 15', and counted fingers at one foot with either eye. A defect in the field of vision corresponding to the detachment of the retina existed, but it could not be determined exactly on account of her very poor sight. The patient remained only one week in the Charité, was confined in October, and presented herself again at the polyclinic of the university in November, 1877. On examination with the ophthalmoscope she is found to be emmetropic in both eyes. The optic nerve is whitish and opaque; the retinal vessels are thin, and close to the optic nerve partly accompanied by short light bands (thickened adventitia). Chorioiditis disseminata is seen in the fundus, also black dots and light spots. In the right eye a small white band is drawn from the upper margin of the optic nerve, horizontally over the macula, and bends downward. It is broadest between the optic nerve and the macula, and is also dotted with black pigment spots. In the left eye two similar bands pass from the optic nerve toward the medial side. In the region of the macula lutea there are also some pigmented spots. No trace of the detach-

ment can be detected in either eye. V. was hardly improved since Aug., 1875 ; with $+\frac{1}{8}$ No. 4.0 was read with difficulty.

It is well known that detachment of the retina, though rarely accompanying retinitis albuminurica, has in these cases a remarkable tendency toward spontaneous recovery.

In conclusion I wish to communicate a case, in which puncture rendered a brilliant, though unfortunately not permanent, result.

CASE 5.—Olga H., twenty years old, came under my treatment on the 21st of March, 1879. The vision in the left eye had been defective for twelve days. R. eye myopic ; with $-\frac{1}{4\frac{1}{2}}$, $V=\frac{6}{8}$. No. 0.3 was read at ten centim. The left eye could only discern certain words of 0.75. There was in both eyes a moderate sclerectasia of about one third of the diameter of the optic nerve. In the left eye the inferior external portion of the retina was detached up to the equator. On April 21st, puncture was performed with a small cataract knife, and a clear, watery, somewhat yellowish liquid was removed. On April 29th atropia was instilled, and at the examination no trace of the detachment could be discovered ; $M=\frac{1}{4\frac{1}{2}}$; $V=\frac{6}{8}$. No. 0.3 was read at ten ctm. On examination with the perimeter the field of vision was found to be perfect. This favorable condition remained until May 1, 1881. On the 5th of May a detachment of retina was found outward and above. $M=\frac{1}{4}$; $V=\frac{1}{8}$. On the 12th, puncture was performed in the same manner as before, outward and above. On May the 23d, the formerly detached retinal portion had quite a normal appearance ; in looking above-outward, corresponding to the punctured part a small retinal hemorrhage was seen. A few days later the detachment had reached its former size.

SYPHILITIC GUMMA OF THE SCLERA.

By J. A. ANDREWS, M.D., OF NEW YORK.

LATE ASSISTANT SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL, NEW YORK.

(With a wood-cut.)

OF gummous nodes in other parts of the eye than the iris, those situated in the sclerotic are of rare occurrence. The publication of the following case may be justified the more, because of its interest with regard to the differential diagnosis:

C. R., stone-cutter, aged forty years, applied for treatment at the Manhattan Eye and Ear Hospital, New York, July 29, 1878. The patient stated that about June 1, 1878, he "got sand into his left eye," in consequence of which the eye became "red and swollen." From this accident he dated the eye trouble for which he sought relief. On the occasion of his first visit to the Manhattan Eye and Ear Hospital the appearance of the left eye was as follows: The entire ocular conjunctiva was intensely injected. At a point beginning about 2''' from the upper part of the limbus corneæ the conjunctiva rose in an oval, cushion-like swelling, half an inch in its horizontal, and three eighths of an inch in its vertical measurement, with a large central depression filled with pus. In the centre of the depression, surrounded by pus, was a dark spot about 2 mm. in diameter. The removal of the pus showed the base of the depression to be ulcerated, and the dark spot just mentioned to be a projection through the ulcerated sclerotic. The upper lid could not be elevated voluntarily, and the projection of the swelling on the sclerotic produced a marked deformity. There was no active iritis, but there were posterior

synechiae from an old iritis. I suspected that the sore was due to constitutional syphilis, but the patient denied ever having had venereal disease. I wrote to the physician at one of the eye and ear hospitals in Boston, under whose care the patient had been previous to visiting the Manhattan Eye and Ear Hospital. The reply was that the case had been recorded, July 10, 1878, as one of "abscess of the ocular conjunctiva (?)." He "made an incision into the swelling, expecting to reach pus; none came, however," and he "came to the conclusion that there was some trouble with the fundus oculi, possibly a growth."

When the patient visited the Manhattan a second time, I de-

sired him to remove his shirt, and several tubercular syphilides were seen on his back. This discovery, of course, placed the diagnosis at rest. The vision of the affected eye was $\frac{1}{100}$. Owing to the cloudiness of the vitreous no ophthalmoscopic examination of the fundus could be made. Under anti-syphilitic treatment the local affection rapidly disappeared, and the visual power, by August 14, 1878, had improved to $\frac{1}{20}$. The patient was absent from New York, from the latter part of August till the middle of January, 1879, during which time he took his medicine regularly, with the exception of periodic interruptions which he had been directed to observe. On January 20th the disease was recognizable, solely by a very slight bluish tinge of the sclerotic, and by some thickened blood-vessels radiating in the conjunctiva above it. Left eye, V= $\frac{1}{10}$. The patient was seen no more after March 15, 1879.

In the above case two other similar affections had to be thought of, *i. e.* : scleritis, and sclerotico-choroiditis anterior. Both of these affections certainly did exist, although there was no increased intra-ocular tension. The presence of gummous deposit in other parts of the body fixed the nature of the inflammation.

Nearly all ocular affections of a syphilitic nature consist of some form of transition between the second and third periods of the disease, and generally occur coincident with accidents of the same nature on the cutaneous surface. But the only affection of the eye pathognomonic of syphilis is of the gummous variety, and this, with very rare exceptions (Mauthner, in Zeissel's "Lehrbuch der Syphilis," Bd. ii; Sichel, *Gazette Hebdomadaire de Méd. et de Chir.*, April 23, 1880, p. 262; Siggel, These ARCHIVES, vol. ix), occurs as a late secondary accident.

Plastic iritis, on the other hand, although much more frequently met with than the gummous form, has nothing in itself characteristic of the disease in question. Although it has been maintained that the sclerotic is, almost without exception, only secondarily drawn into participation by extension of a node from the ciliary body or choroid, and the case above recorded was seen too late to afford an absolute foundation for contradicting the correctness of this; nevertheless, the statement of the patient that there had not, at any time, been pain in the eye, and that the disease was far advanced before any diminution of sight was observed—the patient having frequently closed his well eye to determine whether the sight of the fellow-eye was good,—would perhaps favor the opinion that the disease was primarily seated in the sclerotic, and extended inward by ulceration. Whatever may have been the primary seat of the lesion in the above case, the result was certainly very gratifying, and, judging from the literature of gummy deposit in the eye, the case may be well worthy of being placed on record.

A CASE OF COLOBOMA OF THE CHOROID AT
THE MACULA LUTEA, UNACCOMPANIED
BY COLOBOMA OF THE IRIS.

By SWAN M. BURNETT, M.D., WASHINGTON, D. C.

(*With a wood-cut.*)

COLOBOMA of the choroid, without a concomitant coloboma of the iris, is not so common as to render such cases entirely without interest, particularly when the defect occupies the region of the yellow spot. I therefore put another case on record.

Wm. H. B., a white boy of thirteen years, applied to me for relief of an asthenopia of the *left* eye. I found this eye to have a simple myopic astigmatism of 0.75 ; axis 90° ; $V = \frac{4}{5}$. The *right* eye suffered from a divergent strabismus which had existed since infancy, and had $V = \frac{4}{10}$, with no special improvement by either spherical or cylindrical glasses. He also suffered in this eye from that sudden abolition of vision which I have found frequently in strabismic eyes.

The object, while looking at it with the normal eye closed, will suddenly vanish, leaving a perfect blank. On closing the eye, however, and then looking again, vision is as before ; but any attempt at fixing an object attentively is followed by its complete disappearance for a time.

There can be no question, I think, that this phenomenon is cerebral in its character. It is the habit of the patient to suppress entirely the mental image of this eye in order to avoid the confusion of double images, and in time the cen-

tre of vision in the brain seems to lose the power of retaining an impression for any considerable length of time.

The iris was perfectly normal and the pupil of the same size and motility as that of its fellow. On making an ophthalmoscopic examination I found quite a remarkable change at the region of the macula lutea. About one and a half disc diameters to the

outer side of the papilla, there was an almost perfectly circular white spot. Its edges were very sharply defined, as though it had been cut out with a punch, and there was no accumulation of pigment at its border or anywhere in its vicinity. A few dots of pale pigment were seen on the surface of the spot, but otherwise it was dead white. It had no vessels, nor were there any vessels running up to its edge. The choroid around it appeared perfectly normal, except that about midway between the coloboma and the o. d. there was one spot where it appeared a little thin. The

coloboma was about one half the size of the o. d. The o. d. itself seemed entirely normal. There was no crescent, and the vessels in calibre and course were about as usual. The appearance of the fundus is given in the accompanying figure. The refraction as estimated by the O. S. was emmetropic, and there was no difference in the level of the white spot and the remainder of the fundus. The visual field was normal, there being no scotoma corresponding to the choroidal defect. His color-perception was good, and I was not able to detect any deficiency in this function at the centre of fixation, according to the test for small central scotoma recommended by Dr. Minor,¹ which consists in placing before the patient large sheets of different colored papers in succession and noting if there is any defect in the field.

Manz in his article on the congenital anomalies of the eye,² refers to but four cases of isolated coloboma of the choroid at the macula.³ In Streatfield's case it was circular, and about twice the size of the o. d.; in Talko's,⁴ pear-shaped, and three times the size of the o. d.; in Reich's,⁵ rhomboidal, with the long diameter the size of the o. d.; in Wecker's,⁶ four times as large as the disc, and nearly circular. In all these cases V was below the normal, except in that of Reich, where it was nearly $\frac{3}{8}$. In Streatfield's case, as in mine, there was strab. divrg. and a high degree of amblyopia. In Talko's case the V. F. was concentrically narrowed one half. The color-function was not noted in any one of the cases.

In the case related by me, it might be a question as to whether it was a congenital anomaly or a condition produced by inflammation or injury—particularly as the boy's mother gave a history of two injuries to that eye—one from the explosion of a fire-cracker, and one from a toy arrow. The appearance of the fundus seems to me conclusive evi-

¹ *The American Journal of the Med. Sci.*, for Jan., 1882.

² Gräfe u. Sämisch, B. ii.

³ Streatfield, *R. L. O. H. R.*, vol. v., p. 79.

⁴ Talko, *Zehender's Monatsbl.*, 1870, p. 165.

⁵ Reich, *ib.*, 1872, p. 56.

⁶ De Wecker, *ib.*, 1872, p. 176. The detailed account of this case is to be found in the *Traité des maladies du fond de l'œil, et atlas d'ophtalmoscopie*, Paris, 1870, p. 207.

dence against rupture of the choroid. So far as I have been able to consult the literature of the subject, no traumatic rupture of the choroid has ever been circular, and both in this and in the atrophy after choroiditis there is more or less massing of pigment at the edges. I am therefore forced to believe that it is congenital and due to arrested development.

The fact that there was no defect in vision or of color-perception at the location of the coloboma would seem to prove conclusively that the layer of pigment cells is not essential to either function.

In a reference to the report of the University eye clinic of Modena,¹ in Hirschberg's *Centralblatt*. for 1879, p. 15, it is stated that observations as to the presence of the visual purple at the locality of the defect in coloboma of the choroid, were not successful as to its demonstration; a proof that in man, as in some other animals, the purple is not essential for vision, and possibly takes but little if any part in it.

¹ Ann. d' Ott, 1878, Fasc. 2 and 3, pp. 286-375.

A CASE OF CONGENITAL IRIDEREMIA.

By H. B. YOUNG, M.D. BURLINGTON, IOWA.

THE statement made by Prof. C. Schweigger in his "Hand-book of Ophthalmology," that "irideremia occurs very rarely as a congenital defect either with or without other congenital anomalies," leads me to report the following case :

Willie B., æt. nine years (German parents), anæmic, small, and poorly nourished, was brought to me by his mother, because she "thought he was very short-sighted and had no pupil." Inspection at once showed absence of the iris in both eyes (unless a short strip of color less than 1 *mm.* in width at the lower corneal margin might be called a rudimentary iris), and horizontal nystagmus. With the ophthalmoscope the lenses could be seen in their entirety. Both were in proper position, and both were clear centrally and at the extreme periphery—the middle ground in both being occupied by a ring of fringe-like opacity. Of the fundus, only an imperfect view was had. This was due to several causes. In addition to the nystagmus and lens opacity the child was excited and restless, and the mother in a hurry to be gone, so that what was done must be done quickly. The little that was seen, however, showed nothing unusual. Hypermetropia was present, and estimated at 4 D. V = counting fingers at ten feet, and was improved by the use of the proper convex lenses to about $\frac{10}{100}$. There is no such defect known in any other member of the family in this or past generations. The mother accounts for it (to her own satisfaction) on the ground of a "great trouble" which she had in the third month of her pregnancy, and over which she wept much.

AMYLOID DEGENERATION OF THE EYELIDS.

BY PROF. E. RÄHLMANN, M.D., OF DORPAT, RUSSIA.

(*With plate vi, figs. 1-6.*)

Translated by H. KNAPP.

PARTICIPATION OF TISSUE ELEMENTS.

THE first appearance of the amyloid degeneration must, it seems, generally be placed in the deeper strata of the conjunctiva, where, at least in the majority of the cases examined, I have found the highest degrees of this degeneration. From there the degeneration seems to advance on the one hand toward the epithelium, on the other toward the tarsus. New investigations, however, have convinced me that all the layers of the lid, not excluding the epithelium, muscles, and glands, may be involved in this morbid process. As evidence of this, I may mention a case, in which from an otherwise healthy eye, an amyloid tumor, scarcely the size of a bean, was removed, which penetrated the whole thickness of the lid, and was embedded like a chalazeon,¹ between the skin and conjunctiva, in such a way that it originated in the conjunctiva with a small basis scarcely 3 or 4 *mm.* in diameter. Its origin at the inner surface of the conjunctiva tarsi was indicated by a discolored spot without a trace of thickening or congestion of the surrounding tissue. The whole tumor consisted of cells which had undergone amyloid degeneration, of sclerosed connective

¹ Recently I had an opportunity to demonstrate traces of amyloid degeneration in several cases of chalazeon, the tissue of which had been hardened in alcohol. I shall describe this condition at another place.

tissue bundles, of greatly degenerated clusters of glands, and muscular fibres. The case has been cursorily described in the annual report of the Dorpat Ophthalmic Hospital, 1881, p. 56.

Regarding the degeneration of the conjunctiva proper, there is, as I have before pointed out (these ARCHIVES, vol. x, p. 138), a thick subepithelial stratum of adenoid tissue, whose stroma is abundantly supplied with cells, which, especially in the deeper layers, are unusually large, pale, lustrous and, in some places, glassy and transparent. Whenever this tissue layer is affected with true amyloid degeneration (which is the rule), or when it alone is the seat of the degeneration, the cells, the lymphoid bodies situated in the meshes of the stroma, play a prominent part in the morbid process. The degeneration is either first recognizable in these cells, as fig. 1 of plate vi illustrates, or they participate early in the degeneration if the latter originates in the blood-vessels, which according to my experience is quite rare.

While Wagner,¹ Heschl,² Tiessen,³ Koester,⁴ Schüppel,⁵ and others state that the true amyloid degeneration of the liver originates in the blood-vessels, and assert that the parenchyma cells are destroyed by pressure atrophy without previously degenerating, other authors, Billroth, Friedreich, and others admit a degeneration of the hepatic cells besides a degeneration of the vessels. According to Eberth the degeneration originates exclusively in the connective tissue, and never affects the lymphoid cells (*Zur Amyloidfrage, Virchow's Archiv*, vol. xxiv, p. 111.).

On histological examination of the first stages of degenerated conjunctival tissue, we are readily convinced of the fact that the lymphoid cells play a prominent part in the true degeneration, or are even alone affected. We notice

¹ E. Wagner, Beiträge zur Kenntniss der Speckkrankheit, insbesondere der Speckleber. *Arch. d. Heilk.*, Bd. ii, 1861.

² Heschl, über d. Amyloiddeg. der Leber. *Sitzungsberichte d. K. Akademie d. Wissenschaften*, iii. Abth., Bd. lxxiv, 1876.

³ Tiessen, *Arch. d. Heilk.*, 1872, Bd. xviii, pag. 545.

⁴ Dissertationen v. Sechtem, Schütte. Bonn 1875 und 1877.

⁵ Schüppel, amyloide Entartung der Leber. *Ziemssen's Handbuch der Pathol. und Therapie*, Bd. viii, ii, pag. 359.

(comp. fig. 1) that only the lymphoid cells embedded in the meshes of the adenoid tissue are tinted blue by sulphuric acid, whereas the true stroma cells situated in the nodal points are distinguished by their yellowish color. We must, of course, not examine such cases in which the degeneration is far advanced, and in which every vestige of normal tissue is destroyed. It is, however, not difficult to detect the primary conditions of the conjunctival degeneration, and to recognize the nature of this process, as I have before (*loc. cit.*) pointed out.

"Who has ever seen the first traces of amyloid in the lymphoid bodies?" asks Eberth (*loc. cit.*, p. 112). Pictures like our fig. 1 might fully convince this author. "If the lymphoid corpuscles degenerated they would be recognizable in the meshes of the unchanged stroma," says Eberth, further; and, indeed, we can convince ourselves that in many cases of fresh conjunctival specimens the reticulum is intact (fig. 1), but the exclusively degenerated cells can be recognized by their exquisitely brownish-green or purely blue coloration after iodine and sulphuric acid have been added. It is true that my investigations refer only to the degeneration of the conjunctiva or the lid; I have no experience as to the conditions of the amyloid liver and spleen, but the assertions of Eberth are of a general nature, and formulated as follows: "Neither the direct derivatives of the epiblast, nor of the hypoblast, not even those of the mesoblast, are subject to amyloid degeneration, but solely the connective tissue."

In my opinion, the conjunctiva is the most appropriate place to arrive at final conclusions concerning the pros and cons of the discussion. Its structure is comparatively simple and homogeneous. In some cases, as is illustrated by fig. 1, Virchow's test is exclusively confined to the lymphoid cells. One such preparation would be sufficient to decide the above question. In some of the otherwise homogeneous cells the nucleus is still recognizable, and the different stages of degeneration are observed near one another: at *a* hyaline cell-bodies not reacting on ISO_3 , and still showing the faint outlines of nuclei; at *b* bluish cells having

undergone slight amyloid degeneration; at *c* greatly degenerated single and aggregated cells, stained deep-blue by ISO_3 , in part coalesced so as to form misshapen masses. The pathogenesis of these masses is evident, as the confluence of the degenerated lymphoid bodies can, to a certain extent, even be directly observed. Vermiform figures (fig. 2, *b*) formed by juxtaposition of several cells, are almost invariably seen, but besides them the most varied configurations of the well-known lumpy masses are brought about by the coalescence of several of these formations (fig. 2, *a*).

Certain cases, in which the subepithelial adenoid tissue is degenerating, show strings of cell-bodies (figs. 3 and 4), some of which seem, on the cut surface, to form regular figures. While these strings and cell-chains are stained brown-green by ISO_3 , the adjacent cells remain uniformly homogeneous and transparent, thoroughly hyaline, unstained or only slightly brown-yellow. In such cases we have before our eyes the different degrees of the degeneration at the same time, the hyaline and amyloid degenerations in different stages of development.

In order to obtain instructive preparations which show the just-described conditions, it is desirable, as Kyber has pointed out, to expose the microscopic sections only momentarily to a weak solution of iodine, and after that to a greatly diluted solution of ISO_3 , likewise only momentarily. This produces a moderate staining, acting, of course, chiefly on the most degenerated parts of tissue, admitting of a nice discrimination of the different elements in the section. These methods can, if necessary, be supplemented by deeper stainings.

In the hepatic cells, according to several authors (Kyber, Böttcher), the formation of amyloid begins in the shape of minute granules. Leber (*Graefe's Archiv*, vol. xxv, 1, p. 296) states that the same process takes place in endotheloid cells of the conjunctiva, but he denies its occurrence in the hepatic cells.

If in the foregoing I have located the beginning of amyloid degeneration chiefly into the cells of the adenoid tissue of the conjunctiva, I have not excluded its primary oc-

currence in the subconjunctival fibrous tissue, or even, as mentioned above, in the deeper parts of the lid.

In most of the cases I have found the epithelium completely intact; in several instances, however, I have not only noticed a hyaline, lustrous condition of isolated groups of epithelial cells, but obtained from them positive results by Virchow's test.

I am, therefore, directly opposed to the views of Eberth, but if I had not perfectly satisfied myself of the possibility of the degeneration of the epithelium, the fact that glandular epithelium frequently shows the ISO_3 reaction would have forced me to differ from that author. The walls and the epithelial lining of the glandular tubes of the conjunctiva are frequently colored intensely blue by ISO_3 . In advanced cases I have also found the acini of the Meibomian glands in the interior of the tarsus completely degenerated. The typical location of these glands makes the recognition of the blue stains in their walls, surrounding characteristic calibres, free from error even in those cases where the degeneration has greatly effaced the picture of the normal tissue-elements.

The smaller as well as the larger blood-vessels are frequently found intact even in advanced cases. It is sure that in the conjunctiva at least, the degeneration does not, in all cases, start from the vessels, as Wagner, Heschl, Köster and Schüppel, and I in several cases also, have found. The walls of the vessels are frequently enough found diseased, but they show minor changes than the other parts of tissue. In some specimens the thickened and hyaline vascular walls appear shining yellow, strongly contrasting with the other more degenerated tissue-elements which by ISO_3 are stained deeply blue.

If the vessels are affected they may present all phases of the degeneration. Compare my paper on the Hyaline and Amyloid Degeneration of the Conjunctiva, *Virch. Arch.*, vol. lxxxvii, p. 325, etc. While the capillaries and smaller vessels show no peculiar stratification in the products of degeneration, transverse sections of the larger arteries exhibit all the stages of the degeneration. The adventitia is usually

less advanced in the process of degeneration than the media. In fig. 6 of our plate vi, the muscular coat, *b*, is dirty blue, the intima and adventitia are mahogany, the color produced by ISO_8 in tissue yet little advanced in the degenerative process. The walls of the vessel are greatly thickened and their calibres almost totally abolished.

The degeneration of the middle coat leads to the inference that the smooth muscular fibres early undergo degeneration. The striped muscular fibres, however, soon follow. The fibres of the orbicular muscle are usually affected before the tough connective-tissue fibres of the tarsus. The primary stage of the hyaline as well as of the amyloid degeneration is frequently limited to circumscribed places in the continuity of the muscular fibre. The fibre at these points shows distinct nodular swellings, appears varicose, and loses the appearance of striation. The nodules at first look glassy, later they show the amyloid reaction. The picture of the hyaline degeneration of the muscular fibres of the orbicularis is identical to that which in amputation stumps, in the muscles of typhoid-fever patients, etc., has frequently been noticed and described under the name of lardaceous degeneration. The difference in our cases lies in the fact that the hyaline degeneration is not limited to the muscular fibre, but occurs also in other parts, cells and connective tissues; moreover, in the fact that these hyaline-degenerated muscular fibres are stained mahogany-brown, and occasionally green-brown by ISO_8 .

I have not been able to find any statement in literature whether Virchow's test has been tried on hyaline muscular fibres. According to my views to consider the amyloid degeneration as a purely local tissue-change, occurring accidentally without any dyscrasia, a perfect analogy is certainly possible.

The deeper, so-called subconjunctival, tissue, which is directly adjacent to the tarsus, is frequently the principal seat of the whole affection as has been mentioned above. In such instances sclerosis of the connective-tissue fibre-bundles plays a great part, probably preceding in some cases the true degeneration of the fibrous connective tissue. I

have at least long been cognizant of the difference between two types of the degeneration.

DIFFERENT KINDS OF THE DEGENERATION.

In one class of cases the swelling of the lid is comparatively insignificant, but the degeneration unusually pronounced, almost all parts of the lid reacting regularly and intensely on ISO_8 , though they have preserved more or less their normal characteristic shape. The hyaline degeneration is little advanced; the albumen of the tissue rapidly becomes amyloid; the structure is preserved. Formation of larger masses and decay are seen only in later stages. These are the cases in which a solution of iodine in iodide of potassium colors large portions of tissue dark brown-green, and ISO_8 colors them intensely blue. The moderately swollen tissue is hard and fragile. The fracture-surface is uneven. The prominent granules on it, even macroscopically, but especially on using a magnifier, appear like fish spawn or boiled sago.

In a second class of cases the swelling of the tissues is much more extensive. The hyaline degeneration precedes a long time the amyloid, as proved by Virchow's test. The intumescences have the appearance of lymphoid tumors. The swelling of the parts chiefly results from a proliferation of the conjunctival adenoid tissue. Besides these changes the deep and even the tarsal connective tissue is markedly sclerosed. Cell nuclei are distinctly recognizable in the surroundings of the enlarged connective-tissue fascicles, the fibrillation of which gradually fades away, so that the cross-sections appear homogeneous even under high magnifying powers.

In fresh unstained preparations large areas of the background are beset with round or oval light patches nicely surrounded by a net of unenlarged nuclei. Carmine colors the patches slightly light red, and the intensely stained nuclei are very conspicuous. Later the sclerosed fascicles are glassy light, hyaline, and imbibe the coloring substance less.

The nuclei of the hypertrophied connective tissue show,

in some instances, changes that can be compared with the sclerosis of the connective-tissue fibre. In this particular my views coincide with those of Leber, who compares the formation of amyloid to the sclerosis of the connective tissue. The granulated appearance on slightly magnified specimens, resulting from lymphoid cells scattered through the stroma of the conjunctiva, is lost; the cells coalesce; the tissue in large areas of the microscopic field assumes stiff forms, as if impregnated with hardened wax. The framework of the conjunctiva with cells in its nodal points remains preserved as long as the cases are not too far advanced in the process of degeneration. (Fig. 2, c.)

The tissue thus changed becomes more diaphanous, and some islets in its interior accept Virchow's reagent, while the rest remains unstained. In advanced cases as long as the tissue is not decayed, the stroma is frequently free from the degeneration. In brushed specimens (fig. 5) from which the hyaline and amyloid cell-clusters have fallen out, the presence of an intact though thickened stroma is unmistakable.

Iodine solution alone stains this tissue mahogany-brown. The coloration by ISO_8 is in most of these cases not purely blue, but dull blue-green or green-violet.

The voluminous lid or the conjunctival tumors in such cases have no very hard, but an elastic, resistant feel. The cut surface has no granular, but a tough, lardaceous consistence.

ON THE IMBIBITION OF THE AMYLOID SUBSTANCE, AND THE GENESIS OF THE LUMPY MASSES.

Most authors consider amyloid to be a solid substance which either originates as such in the tissues (Cohnheim, Leber), or is there deposited from the blood-vessels (Rindfleisch, Tiessen, Köster, Schütte). Some authors, however, specially mention its property of imbibition; for instance, Perls (Lehrbuch der allgemeinen Pathologie, 1877, p. 185, etc.) thinks that amyloid degeneration is connected with swelling by imbibition, resulting from some alteration of the circulating fluids. Eberth (*l. c.*, p. 112) states that the whole process, from insignificant imbibition to the formation

of lumpy masses, has frequently enough been studied. Imbibition has so decided an influence on the formed elements of the amyloid substances, that the discussion on the participation of different kinds of tissue in the process of degeneration will reflect the views which each author holds on its nature. It is evident that correct opinions can only be gained from initial stages of the disease, *i. e.*, from studying the progress of the morbid process by periodic excisions of diseased parts. For this reason no organ offers more favorable conditions of observation than the free and directly visible conjunctiva.

Initial stages of the disease, as illustrated in figs. 1, 2, and 3, throw sufficient light on the significance of imbibition as to the formation of the shapeless masses (Schollen). Thin sections of specimens hardened in alcohol very distinctly exhibit the characteristic forms of the adenoid tissue underneath the conjunctival epithelium. If specimen is quickly exposed first to the influence of an iodine-iodide of potassium solution, and then momentarily to that of an ISO_3 solution, and without delay looked at through the microscope; or, still better, if during the observation of the microscopic specimen the reagents are added according to the manner described by Kyber, we recognize, while the cells assume a blue color, the nuclei, the cell contours, and the normal intercellular framework, with the tissue cells in its nodal points. The outlines gradually disappear; the blue cell-bodies bulge, touch one another, and coalesce; and the true shapeless masses are ready. In this stage the original forms of tissue can be approximately restored by the action of a weak solution of tannic acid. The nodular (varicose) intumescence of the sclerosed connective-tissue and muscular fibres, as described above, indicates local imbibition of the tissues. Acetic acid does not seem to greatly favor this imbibition, for I have never been able to notice a definite influence of this reagent on amyloid tissue.

As it is commonly supposed that a substance which is capable of swelling by imbibition is also in a certain degree soluble, and as I have demonstrated (*Virchow's Archiv*, Bd. lxxxvii, p. 325, etc.) that the absorbability of amyloid in the

organism cannot be doubted, I have finely powdered a quantity of exquisitely amyloid-degenerated tissue, after it was hardened in alcohol, and have treated it with distilled water for a long time. The liquid, passed through a filter, looked somewhat turbid, and showed a weak reaction of albumen, but not of amyloid. It seems that an albuminous body, after enormous swelling by imbibition, passed through the filter. This seems to indicate that in the degenerated tissue, besides the amyloid a greatly swollen body (perhaps mucin) is present, which gives the first impulse to the formation of substances showing a positive ISO_8 test.

Explanation of the Figures of Plate vi.

Fig. 1.—Amyloid degeneration of the subconjunctival tissue, treated with ISO_8 . *a.* Hyaline-degenerated cells. *b.* First appearance of amyloid, characterized by a slightly blue color. *c.* Very pronounced amyloid degeneration of coalesced groups of cells. (Hartnack syst., 7 ; eye-piece, 4 ; tube not drawn out.)

Fig. 2.—*a.* Coalesced shapeless groups of cells, hyaline-degenerated. *b.* Utricular masses formed by juxtaposition of degenerated cells. *c.* Remnants of stroma with nuclei.

Fig. 3.—Incipient amyloid degeneration. Formation of cell-strings by juxtaposition. The specimen has been treated with ISO_8 . Staining partly brown, partly green-violet.

Fig. 4.—Advanced stages of the same changes. (Hartnack syst., 7 ; eye-piece, 4. The outlines traced by means of the camera lucida.)

Fig. 5.—Shaken specimen of tissue having undergone marked amyloid degeneration. Stroma from which the amyloid masses have fallen out. (Hartnack syst., 7 ; eye-piece, 4.)

Fig. 6.—Transverse section of an artery, treated with ISO_8 , showing various stages of amyloid degeneration side by side. *a.* Inner coat, stained brown. *b.* Middle coat, blue-green. *c.* Outer coat, brown. (Hartnack syst., 7 ; eye-piece, 4 ; tube drawn.)

DORPAT, Jan., 1882.

THE BLOOD CIRCULATION IN THE REGION OF THE YELLOW SPOT.

By WILLIAM C. AYRES, M.D., NEW YORK.

(With a wood-cut.)

HAVING tried over and over again to get at the exact anatomy of the distribution of the blood-vessels around the macula lutea and fovea centralis, by making injections, rendering the retina transparent with oil of cloves, and examining flat preparations with the microscope, I came to the conclusion that the method was inseparable from so large a factor of chance that entoptic observations were much more satisfactory. I have, therefore, devoted much time and pains to them.

As nature furnishes a better injection of small capillaries in the living state than we can ever hope to reproduce artificially, and since certain precautions in experimentation render observation on the living blood-supply so easy, we obtain a far better idea of the true state of things in the living retina than from the best-injected specimens hitherto produced.

There are many ways of demonstrating the retinal vessels entoptically which have been long known, but I have found others which are perhaps interesting enough to deserve publication.

The first way in which it can be done was furnished by Purkinje, which consists in concentrating light on the sclera in a dark room. The explanation of why we see the retinal vessels in this experiment is easy. The second was more

fully described by H. Müller. The third is by placing a diaphragm with a small hole in it in front of the eye, and moving it while the eye is directed toward a clouded sky. The fourth is by looking through a microscope and either moving the instrument or the head rapidly through small excursions.

The first of these methods differs from the rest in the fact that the light is made to pass into the eye through the sclera or in an unnatural way. In the others the light passes through the pupil as usual. But the explanation of why the retinal shadows become perceptible is essentially the same in all.

Helmholtz, in his book on physiological optics, explains the result of the experiment of looking through a small hole, in the following manner: He says the reason why we do not see the vessels in our own eye under ordinary sizes of the pupil, and the reason why we see them when we look through a hole that makes the beam of light entering the eye smaller than it is when it passes through the pupil, depends upon the difference in the distinctness and length of the shadows of the blood-vessels when the beam of light is large or small. According to him, under the usual conditions the shadows must be broad, indistinct, and short, whereas the central shadow cone in a narrow pupil is very much the contrary. He also states at some length that when the pupil is wide the length of the shadow cone is not sufficient for its apex to reach the percipient elements of the retina. The shadows can be only 4-5 times as long as the width of the vessel casting them, and since, according to E. H. Weber, the thickest branch of central vein is only 0.038 *mm.*, and according to Kölliker the retina is 0.22 *mm.* thick in the background of the eye, the apex of the shadow cone would not reach the layer of rods and cones, but would fall somewhere else in the tissue of the retina. When the beam of light entering the eye is smaller, the shadows will be narrower but more distinct and longer; in this way they become long enough to reach that part of the retina which can take cognizance of their existence.

This explanation is quite ingenious, but at the same time,

if I understand it well, it is unsatisfactory, since the success of the experiment is entirely independent of the size of the pupil, or the beam of light entering the eye. In fact, if we put homatropine in one eye, the wider the pupil dilates the more distinct the vessels become, provided we have some way of throwing the shadows into positions on the retina in which they are not accustomed to fall in any given direction of the optical axis.

There are other ways of rendering the vessels in one's own eye apparent, in which the size of the pupil is not interfered with. For instance, if we hold a solid body with sharply defined edges close to the eye and oscillate it, when the edge of the body comes opposite the edge of the pupil the vessels will appear, if we look toward any luminous object. The body need not cover any part of the pupillary space, but if it does, the vessels still remain distinct. In the same way, if the solid body is held between the eye and a distant light, the edge of the light nearest to the solid body will be colored red, and the edge away from it blue or violet. This shows that there is a series of refractions produced which overlap each other in such a way that all color is done away with, except the extreme red end of the least refracted, and the violet end of the most refracted, spectrum. In this way the light which passes the edge of the solid body on its way toward the retina, is bent so as to fall on a part of the retina upon which it is not accustomed to fall. This experiment is peculiar, since neither the head nor the source of light has to be moved.

The most beautiful way of all, and in fact the easiest, to show the retinal blood-vessels is to put homatropia into the eye, then stand with the back to a common gas flame, and so adjust a plain gold ring close to the cornea that its convex surface will throw a *blurred* image of the light into the eye. The slightest movement of the ring will cause every capillary around the macula lutea to be seen with the greatest distinctness. Since the surface of the ring is rather small, if we obtain an ordinary teaspoon and place it near the cornea, either with the concave or convex surface toward the light, the extent of area over which the vessels become

visible is much greater, and the individual vessels are just as distinct. It makes no difference in this experiment whether the spoon or the head be moved, since in either case the shadows will fall on the retina in places where they are not accustomed to fall. The experiment is not very trying on the eye. Either the spoon or the head must remain stationary while the other is moved. If we open the other eye and look toward a piece of paper, the vessels will be seen as if projected on the paper, where they can be traced as with a drawing prism. It can, however, not be done with perfect exactness, for the motion which is necessary to make the vessels appear causes them to move on the paper, as can be easily explained. I have endeavored to reproduce the vessels in the retina of my left eye in this way. (See drawing.) Whereas the drawing is not exact, it has a great de-

gree of proximity to the true condition of the retinal circulation around my macula lutea. There are peculiarities in it which I would hardly think constant; for instance, the large vessel which runs across the macula lutea to the left. This vessel is so large that Dr. Knapp could see it with the ophthalmoscope on examining my eye with that instrument. I could not distinguish which were arteries and which were

veins, but seven large vessels came from above, and five from below, making twelve in all. The above-described particular movement I tried to make circular, so that all of the blood-channels would appear, but I find that by a vertical movement other vessels occur which are not in the plate. When the motion is only horizontal the vertical vessels are of course seen plainest; and when vertical, the horizontal ones come out more distinctly.

The vessels are more rapidly reduced in size as they near the macula lutea than they appear in the drawing. I have drawn them a little larger, so as to show the peculiar *anastomosing capillary corona* which surrounds the macula. It consists of a series of loops. There are also large vessels in the vicinity which do not run to the macula but pass by to the sides. These I have not represented. The central clear space is about as large as my macula lutea appears. In it are innumerable dots which must be either the retinal granules or the bulbs of the cones. They are arranged more or less radially around the fovea centralis. The fovea itself does not seem to be in the centre of the macula, but in the projected image a little upward and inward, or in the eye downward and outward.

If the light be not too bright and the motion of the ring, or rather the spoon, be very rapid, the motion of the blood-currents in the capillaries is also seen, but not *very* distinctly.

Homatropia is not essential to the success of the experiment, but it gives a greater area over which the vessels are seen, and also the whole picture is much more distinct.

If any one who has never had a good view of the circulation of his own eye will repeat the little experiment, I am sure he will be delighted with the ease with which he can do it, and with the beauty of the picture, which he cannot fail to see.

There is still another way of rendering the retinal vessels apparent, which has the peculiarity of not requiring any motion either of the source of light or of the eye, viz.: Place a solid body, like the finger, close to the cornea, and look toward the light. The vessels will be seen on account

of the deflection of the rays entering the eye. The vessels appear without any vibration of the finger. If we then remove the finger, the vessels become distinct, with the difference that before they were dark shadows, whereas after they are light streaks.

There are again other methods, such as letting the light be reflected from the cornea of some one else and fall into your own eye, the two eyes being very close together. If either the eye assisting in the experiment or your own eye be moved, the retinal vessels come nicely into view.

Also, if in smoking a cigar in the dark, we blow off the ashes, so as to render the lit end bright, and place it close to the eye and oscillate it, the blood-vessels will be seen quite nicely.

There are many details concerning the rapidity of the blood-currents in the retina depending upon their distance from the macula lutea which I reserve for a future contribution, since I have found quite a convenient method of recording the velocity of the blood in the retinal vessels.

REPORT ON THE 14th MEETING OF THE
OPHTHALMOLOGICAL SOCIETY AT
HEIDELBERG, SEPT. 14-16.

BY DR. A. NIEDEN, BOCHUM.

Translated by Dr. F. E. D'OENCH and Others.

The meeting, which was well attended, especially by the younger members, was called to order by Prof. v. ARLT, who reported that the judges chosen to award the v. Wells prize for the best paper which had appeared in *v. Graefe's Archives* during the last three years, could not yet give their decision. The meeting expressed the desire that the judges (who were present) would consult, and that their vote should then be final.

Prof. BECKER was elected president and proceeded to the order of business. NIEDEN read a paper on recurrent idiopathic hemorrhages into the vitreous in young men. He concurs with v. Graefe, Eales, Hutchinson, and Schweigger, in considering it a rare affection, as he saw it but nine times in young men from fifteen to twenty-four years among 35,000 cases. The sudden complete obstruction of the field of vision is characteristic, which is due to a diffuse darkening of the vitreous humor by hemorrhages, sometimes in its anterior, sometimes in its posterior portion; their cause cannot be traced; they are not due to a diseased condition of the blood-vessels (albuminuria, diabetes, syphilis, gout, hæmophilia, etc.), they are rapidly absorbed, but are soon followed by similar attacks. As many as seven relapses were observed in one year, which sometimes affected the one eye, sometimes the other; of the nine eyes the right being affected five times, and four times the left. The final result was generally favorable: complete restitution of the central power of vision, slight peripheric defects; only once, after three relapses, the globe remained so distended,

that the emmetropic eye was converted into a myopic one of 6 D. After absorption the hemorrhage was found to have proceeded from the equatorial region of the fundus, where irregular, disseminated patches, lined with pigment, were visible, over which the blood-vessels passed in normal manner. Judging from the sudden development and extent of the hemorrhage, and the choroidal changes just mentioned, it is probable that the hemorrhages are due to a bursting of choroidal blood-vessels in the region of the equator, which also ruptured the retina. Their cause may be sought in the irritation of the blood-vessels, due to the sexual development, and may thus be explained in the same way as epistaxis at the age of puberty. Good results were obtained by giving hydr. biniod. rubr., and potass. iodid.

The paper was discussed by SCHWEIGGER, who called attention to similar cases in women ; and LAQUEUR, who pointed out the development of myopia as the result of distension of the envelopes of the globe.

Prof. LEBER spoke on the genesis of detachment of the retina. He spoke of the theories now held, and showed the untenability of some of them for the usual form of detachment ; for instance, of the theory based on pressure from behind, or on cicatricial contraction of the choroid, or on distension of the envelopes of the globe. Relying upon his experiments in regard to the introduction of foreign bodies into the interior of the globe, Leber frequently observed a few days later extensive detachment and rupture of the retina, which, of course, was not directly due to the injury in question. When unoxidizable or hard-oxidizable substances were introduced, like glass, gold, etc., detachment did not ensue, but it always followed the introduction of easily oxidizable metals on account of the structural changes produced by them in the vitreous. The injection of certain chemical substances produced similar results. Perforation of the retina was always the first symptom of detachment, so that to it may be traced the ensuing detachment, as it permits the vitreous to penetrate behind the retina. In most of the recent cases observed in which the detachment had rapidly developed, a similar condition was found, as in eleven out of fifteen cases the perforation could still be easily recognized, and in three only could not be traced. Out of twenty-seven cases of chronic detachment the perforation was still visible in fourteen, in five it was doubtful, and in eight the investigation failed.

V. GRAEFE has called attention to the existence of a perforation ; v. WECKER shares the same opinion ; LEBER has demonstrated its existence as a rule. The rupture of the retina is therefore due to traction from within, as is apparent from its ragged appearance, the presentation of the base toward the periphery, and the inward turn of the ragged edges.

The retraction is due to structural changes in the retina, as is apparent from the fibrillous character of some of the fascicles, the agglutination between the vitreous body and retina, which frequently shows hypertrophy of the supporting tissue, etc. Both the vitreous and retina remain transparent, so that frequently this change cannot be seen with the ophthalmoscope. By thus assuming that the vitreous penetrates behind the retina, the chemical similarity of the liquid before and behind the retina, which has frequently been proven in detachment, is explained.

If this explanation is correct, the attempt to remove the sub-retinal liquid by a cut or paracentesis must fail ; perhaps an extensive equatorial incision might counteract the traction from within, and thus effect a cure.

In the discussion which followed, SCHWEIGGER pointed out that he too had not infrequently seen ruptures of the retina in recent and extensive cases of detachment, and had called attention to this in his text-book. V. ARLT is opposed to the use of the term "solutio," which he does not consider appropriate, and would like to substitute "secessio" for it. SAMELSOHN defends the mechanical theory. BECKER and ARLT report cases of sudden detachment in older persons after a hot bath.

Prof. SATTLER spoke of his continued investigations upon the development of trachoma owing to micrococci, as already reported at the previous Congress, and now revised in accordance with the new methods of Koch. The results of breeding and vaccination were with this method also of the same positive character, so that these latest experiments directly confirm the results of last year. The details of the method of breeding were described. It is characteristic of these round micrococci that they never assume the zoöglœa type, but always appear singly or in pairs, the latter also separated by a small interstice. One of the principal characteristics also is the extensive subdivision of the nuclei of the trachoma granule. The result of vaccination of animals was very favorable. The third generation also, when transferred to the human conjunctiva, gave rise to a trachomatous

eruption, taking a slow and mild course. The micrococci of trachoma only produce similar formations upon the conjunctiva, while inoculation with other fluids containing numerous micro-organisms, for instance, decomposing blood, lochial secretion, gonorrhoeic pus, etc., failed to produce trachoma granules. Probably the micrococcus of blenorrhœa neonat. is one disseminated in the air. As for the therapeutics, the antiseptic treatment would seem the most rational. The solution of sublimate, however, which was praised so highly, did not prove so successful in the treatment of trachoma as in that of gonorrhœa, although it reduced the secretion.

Discussion.—BAUMEISTER, like KERSCHBAUMER, is in favor of the use of iodoform in cases of infectious conjunctivitis and keratitis. SAMELSOHN reports a case of tubercle bacilli, in a case of tuberculosis of the iris. LEBER constantly found micrococci in fresh cases of hypopyon keratitis, and in acute panophthalmitis of traumatic origin in the vitreous, though suppuration had not yet begun.

UHTHOFF reported his observations on the pathological anatomy of episcleritis and spring catarrh, the specimens of which were obtained by the operative removal of the nodules combined with scarification of the subconjunctival tissue, the method described by SCHÖLER, or by direct abscission of the hyperplastic conjunctival margin of the cornea. In the specimens of episcleritis the blood-vessels were found widely distended, the immediate surroundings of their sheaths strongly impregnated with round cells, the subepithelial tissue of the conjunctiva infiltrated, and here and there exudations containing numerous cells. The lymph-vessels also were considerably distended, and in one place had developed into a system of cavernous lacunæ. The endothelium was frequently destroyed. The specimen of spring catarrh was obtained from a young man of twenty, who had suffered since he was twelve years old from eczema of the knee and elbow, which for five years had regularly returned every summer. After that he suffered for six years from bilateral typical spring catarrh. The excrescences of the limbus were abscised, when the epithelium was found considerably thickened and extending inward like in cancer. There was, however, no arrangement in layers. Below the epithelium there was a homogeneous layer, without nuclei or cells, frequently assuming the form of nests. The stroma itself was but slightly altered.

In the afternoon session, Prof. v. ROTHMUND presiding, LEBER demonstrated the microscopic specimens illustrating his paper read in the morning, also UHTHOFF.

STORY (Dublin) demonstrated his self-registering perimeter, which, though simpler than that shown by STEVENS at last year's Congress at London, is not well adapted for daily use. He also showed some fine specimens of divided eyeballs embedded in gelatine according to a method of PRIESTLY-SMITH, which seem admirably adapted for macroscopic demonstration.

DÜRR explained his clearly arranged plates, which graphically represent the conditions of refraction and accommodation of both the higher and lower schools of Hanover.

BAUMEISTER showed an ophthalmoscope for the determination of refraction, designed by himself for the use of students, with a disc containing only seven lenses (3+, 4-).

BERLIN demonstrated some fine ophthalmoscopic pictures of the fundus of the horse, representing the normal appearance of the optic nerve, the papilla, and the region of the tapetum. He also explained the construction of a little instrument designed to determine the base line in writing, the description of which is contained in the paper on the hygienic advantages of the oblique system of penmanship.

BECKER spoke of Thomas' curves and the interfibrillous channels of the lens described by him, elucidating his remarks with models and drawings.

Saturday, September 16th.—The meeting was called to order by the chairman of the day, Prof. SCHWEIGGER. HELFREICH spoke of the venous pulse of the retina and intra-ocular circulation, referred to the views accepted at present, but did not consider them sufficient to explain the phenomenon. The important point is that the venous pulse does not coincide with the systole, but with the diastole, of the heart, and secondly, that it is not produced in the eye, but is the result of the circulation of the cranium. The intra-ocular depends directly upon the intracranial circulation. As experiments have shown, the pressure in the veins of the skull is abnormally high and constantly fluctuates with the pulse, immediately following the systole of the heart. These fluctuations become apparent in the venous pulse of the retina, as the vena ophthalmica empties into the cavernous sinus, which is affected by the pulse. The reason why the pulsation is visible only upon the papilla, and not in the retinal veins, must be

ascribed to the anatomical conditions, the veins upon the disc being but loosely attached, while those of the retina are bound down more firmly and cannot therefore dilate to the same extent. Compression of the jugular vein at once stops the venous pulse in the eye. No pulsation is observed in the vorticosse veins, on account of the great vascularization, the distension, the more rapid circulation, and the difficulty of interruption in these choroidal vessels, although theoretically the existence of a venous pulse in them must be assumed. As regards the circulation in the ciliary blood-vessels and retinal arteries, no pulsation is visible under normal conditions.

Prof. BERLIN then read a paper on the hygienic advantages of the oblique system of penmanship. The physiological part of the question has been discussed in the last number of *v. Graefe's Archives*. The results are based upon a large number of examinations and measurements of the position of the head and body of school-children when using the vertical as well as the oblique system, and in horizontal position of the book and when tilted toward the left. When the book lies horizontal the child must turn its head toward the right, the spinal column is also turned, and scoliosis is the result. Out of 460 children who were measured, the right eye was found nearer the writing in 4 %, the left in 73 %; in only 23 % both eyes were equally distant. The average distance from the book was 10.5 *cm.*, instead of 25 *cm.*, as it should be. A great strain upon the accommodation thus resulted, about two thirds more than necessary. When the book was then placed obliquely, the distance of the head from it at once increased when the child wrote slantingly. The same was the case with the vertical system. Although the advantages of the two systems in this position are therefore about the same, the oblique, nevertheless, is preferable, as it requires less muscular exertion of the whole arm, the vertical system exercising the arm up to the shoulder.

Discussion.—LAQUEUR favors the oblique system combined with an oblique position of the book, as it throws the work more upon the flexor muscles of the arm, which naturally are the stronger ones. MANZ arrived at the same results; he also thought the form of the German and Latin letters ill adapted to the vertical system. The crooked position of the child is also due to the greater muscular exertion caused by the rigidity of the steel pen; attention should therefore be paid to this point also. PFLÜGER ascribed the near approach to the book to the tendency of the

children to see every thing as large as possible. In opposition to FRÄNKEL, who believes the oblique system to be unphysiological, BERLIN pointed out that the greater rapidity of execution had obtained for it the right of existence in these days when quick work has become a necessity.

HÄNSELL reported his investigations upon the structure of the vitreous body, particularly as regards the origin of the pus-corpuscles in inflammation of the vitreous. He declared in favor of their idiopathic pathogeny. They are derived from the remnants of the cells which still exist as such in the embryo, and the pathological processes in inflammation are exactly analogous to those which can be observed in the physiological development of the embryo.

Prof. ZEHENDER spoke of the danger of peripheric prolapse of iris and its tendency to subsequent acute irido-cyclitis. He ascribed the cause of this generally deleterious process to the constant drag exerted upon the iris by the scar. He is therefore opposed to the abscission of the prolapse, as this only serves to increase the traction. He obtained good results from a small iridectomy performed laterally from the prolapse, which rather resembled an incision into the inner edge of the coloboma, and thus reduced the tension. ARLT referred the cause of this purulent irido-cyclitis principally to mycotic infection, due to superficial loss of epithelium of the projecting prolapse; LEBER, also, who saw recovery in only extremely few cases. In order to facilitate the healing of the wound, it is advisable to abscise the prolapse. BERLIN, MAYWEG, PFLÜGER, and ROTHMUND were partly in favor of iridectomy, abscission, or entire non-interference.

Prof. ARLT briefly described a method of operating for entropion and distichiasis recommended by TAMAMCHEF, which consists in dividing the lids from their margin into an outer and inner portion, and then introducing the nitrate of silver, in order to produce a strong cicatricial tension outward. The result in two cases was favorable.

NIEDEN showed a collection of vulcanite eyes for children and laborers made according to his directions, whose advantages for certain purposes are becoming universally recognized, and declared that they had served him in good stead in the dead-house, in replacing eyes which had been removed for examination. Before the coffin is closed they are removed and kept for further use.

The admission of ten new members was reported, while two had died. The prize of Ritter v. Wells will not be awarded until next year, as the judges were not all present.

In the afternoon session Prof. PFLÜGER spoke of the treatment of glaucoma. The increased tension is not the result, as has heretofore been assumed, but the cause, of the choroidal affection, which always exists. New manometric tests have confirmed the observation already made, that all mydriatics, and also pilocarpine, primarily reduce the tension in the normal eye, while eserine increases it. The opposite effect in glaucoma is due to the pathological changes in the eye, especially the altered position of the iris. Eserine sometimes also acts by its stimulating action upon the nutrition of the eye. Pflüger has seen no permanent cures from sclerotomy ; iridectomy has not been superseded : the former should only be practised when there is suspicion of malignant glaucoma and the eye becomes soft after the escape of the aqueous humor and remains so.

PFLÜGER then reported his experiments on the injection of fluoresceine into the optic nerve of the dog, in order to test transmission from one optic nerve to the other. After an injection under the pia or dura mater of one eye, fluorescence of both retinæ at once set in, thus proving the direct connection of both retinæ by means of the optic nerves, and strengthening the theory of transmission of sympathetic irritation through them. In the rabbit, not the retinæ but the choroids showed fluorescence. If the injections under the dura mater are carefully made, the eyes return to their normal condition.

SYSTEMATIC REPORT ON THE PROGRESS OF
OPHTHALMOLOGY DURING THE SECOND
QUARTER OF THE YEAR 1882.

By H. MAGNUS, Breslau ; C. HORSTMANN, Berlin ; AND
A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

E. NETTLESHIP, London ; C. E. FITZGERALD, Dublin ; E. MARCKWORT
and P. VON MITTELSTÄDT, Antwerp ; DANTONE, Rome ; VAN DER LAAN,
Lisbon ; HIRSCHMANN, Charkow ; S. M. BURNETT, Washington ; OLE
BULL and SCHIÖTZ, Christiania.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE ;
GENERAL PATHOLOGY, DIAGNOSIS, AND THERA-
PEUTICS ; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL,
AND HISTORICAL SUBJECTS.

1. BEER. Introduction to the higher optics. Revised by Victor v. Lang.
Second edition. Braunschweig, 1882, vol. ix, p. 423, 8vo.

2. BOURNEVILLE. L'année médicale, 1881. Paris, 1882. E. Plon. The
chapter on ophthalmology, written by Poncet, fails to mention where the origi-
nal articles can be found.

3. BURNETT. How we see. Lecture delivered at the National Museum
in Washington, April 29, 1882. *Saturday Lectures*, No. 8, Washington, 1882.

4. CARO et CUOMO. Compendium d'ophthalmiatrie pour les étudiants et
les médecins praticiens. Naples, 1882.

5. HELLER. The history of physics from the time of Aristotle to the pres-
ent day. Vol. I. From Aristotle to Galilei. Stuttgart, 1882, vol. xii, p. 411.

6. KRENCHEL. *Annual report* on the Scandinavian ophthalmological literature for 1881. *Centralb. f. pract. Augenhk.* Supplement to the report for 1881. Leipzig, 1882. And Krenchel: Om Synsprøver for Sömand. *Hospitals-Tidende*, May 24, 1882.

7. MASSELON. Examen fonctionel de l'œil. Paris, 1882. For the use of beginners. Short, but clearly presented. Can be recommended.

8. MARTIN. Des affections oculaires chez les gens de campagne. Paris, 1882.

9. MENGIN. Une visite aux grandes cliniques d'ophthalmologiques de Paris. *Rec. d'ophth.*, June, No. 6. In glaucoma iridectomy is preferable to sclerotomy. Neurotomy is not a rational operation. Reproduction of the debate on antiseptics at London.

10. MOOREN. Five lustra in the practice of ophthalmology. Wiesbaden, 1882, iv, 311, 8vo.

11. NAGEL. Contributions from the ophthalmic clinic at Tübingen, third number. Tübingen, 1882. Contents. Schleich: Clinical statistics on myopia. Weiss: Contributions to the anatomy of the myopic eye. Nagel: Statistical notes from the ophthalmic clinic at Tübingen. The individual articles are reviewed in the various sections of this report.

12. NETTLESHIP. Diseases of the eye. London, 1882. This text-book, now in its second edition, is, for students, undoubtedly one of the best in the English language.

13. v. OETTINGEN. Eye and ear. Lecture delivered Jan. 30, 1882. Dorpat, 1882. Popular comparison between the two senses. Nothing new.

14. PAGENSTECHER. The care of the healthy eye. Annual report for 1881 of the Charitable Ophthalmic Hospital at Wiesbaden. Wiesbaden, 1882. Popular.

15. PONCET. Hygiène des écoles au point de vue de l'organe de la vision. *Rev. clin. ocul.*, No. 4, Apr., 1881.

16. WILLIAMS. Why we have two eyes and two ears. *St. Louis Med. & Surg. Journ.*, vol. xlii, 4.

The first edition of BEER's (1) introduction to the higher optics appeared in 1852. Its manifold advantages soon made the book indispensable, so that a second revised edition is very welcome. The great progress of ophthalmology since 1852 is thoroughly considered, while some chapters, for instance the second part which treats of double refraction, have been materially altered. The theory of Cauchy has been supplemented in a manner to bring it into better accord with the facts. The tables containing the coefficients of refraction of singly refracting bodies have been omitted, also those containing the optic constants of crystallized bodies.

BURNETT (3) explains the act of vision in a very ingenious though elementary manner, and with especial regard to the perception of color. He is inclined to consider color-sense as a higher form of development of the nervous functions.

HELLER (5) in his history of physics has given a new impulse to historical investigations in the field of the natural sciences. Of course the subject of optics is only briefly treated in his excellent book, for the whole range of physics

had to be considered. It is sufficient, however, to give a good idea of the development of optics. The investigations of every author upon the subject of optics are accurately stated, and what they have done for the theory of vision.

KRENCHKL (6) reports upon the regulations which have been adopted in Denmark in regard to the examination of applicants for the service in the navy. As a member of the committee which was appointed by the government to supervise these regulations, he sets forth the reasons which induced him to propose the course of procedure which was accepted, and which, in most points, agrees with that adopted by the International Medical Congress at London, in 1882. In some respects, however, it differs. For instance, it was ordained that not hypermetropia of 1 D, but of 2 D, should exclude from active service. A cursory examination of the field of vision is ordered. Colored glasses and lamplight are used for testing color-perception, the results to be verified with Holmgren's method.

OLE BULL.

In the course of 25 years MOOREN (10) has treated 108,416 patients, and performed 17,952 operations as follows: 2,330 cataract-extractions with scleral section, 542 with corneal section; 368 divisions of cataract; 766 operations for secondary cataract; 6,179 iridectomies; 327 iridotomies; 5,043 tenotomies; 222 advancements; 761 enucleations. The different diseases of the eye treated during this time are arranged in special tables; this statistical material, however, is too extensive for reference, though very instructive; we must be content to call especial attention to this valuable work. Mooren has made his enormous practical experience subservient to the interests of science in the most extensive manner, which he now offers in the work referred to. It need scarcely be mentioned that it contains a large number of the most exact observations and a great variety of practical notes on all chapters of ophthalmology. Mooren's observations are especially valuable, as he always attempts to place them upon a physiological and anatomical basis. The result is that some chapters are of interest not only to the specialist, but also to the general medical public. For instance, the manner in which he explains the action and therapeutical importance of the cutaneous irritants, is of importance not only to the oculist but also to the general practitioner, and well adapted to place this method of treatment, so much maligned, upon a firm scientific basis. The remarks upon the heredity of disease and other subjects are of the same general interest.

b.—STATISTICAL PAPERS.

1. KIPP. Second annual report of the Newark Eye and Ear Infirmary, for 1881. 2,071 eye patients; 359 operations; 14 extractions.
2. Cologne Ophthalmic Hospital for the Poor. *Seventh Annual Report*. Cologne, 1882.
3. NAGEL. Statistics from the ophthalmic clinic at Tübingen. Communications from the ophth. clinic at Tübingen. Number iii, Tübingen, 1882.
4. PAGENSTECHER. Annual report, for 1881, of the Ophth. Hospital for the Poor at Wiesbaden. Wiesbaden, 1882.
5. Presbyterian Eye and Ear Charity Hospital. *Fourth Annual Report*, for the year ending December 1, 1881. Baltimore, 1882.

6. ROSMINI. Rendiconto clinico del' istituto oftalmico di Milano per il quinquennio 1874-78. *Gaz. med.*, No. 14.

7. SELLINGO. Ambulatorio clinico oculistico. Septimo rapporto annuale. Anno, 1881. *Gaz. med. di Roma*, No. 10, Maggio, 1882.

8. SCHLEICH. Clinical statistics on myopia. Communications from the ophthalmic clinic at Tübingen, No. iii, pp. 1-63.

9. SCHMEICHLER. Cataract-extractions at the clinic of v. Arlt. *Wiener med. Wochenschr.*, 1882, No. 15.

10. SMITH. Report of the Eye and Ear Department of St. Mary's Hospital, Detroit, Mich., 1882.

11. STRUWE. First annual report of the Ophthalmic Institute at Gleiwitz, 1880-1. 1,434 patients, 95 operations.

12. WICHERKIEWICZ. Fourth annual report of the Charitable Ophthalmic Hospital in Posen, for the year 1881.

13. Zestiende Verslag van het bestuur der vereeniging tot het verleen van hulp aan minvermogene ooglijders voor Zuid-Holland, gevestigd te Rotterdam, loopende over het jaar 1881. 2,892 patients; 152 operations; 38 extractions.

The ophthalmic clinic at the University of Tübingen (3) was opened in the year 1875, and attended by (?) patients; in 1876, by 778; in 1877, by 980; in 1878, by 1,226; in 1879, by 1,213; in 1880, by 1,471; and in 1881, by 1,679. During this time the following operations were performed: 472 extractions; 124 iridectomies; 9 scleral punctures in detachment of the retina; 66 squint-operations.

In Wiesbaden (4) 1,665 diseases of the eye were treated and 304 operations performed; 18 cataracts were extracted within the capsule, 17 of them with good result; 26 modified linear extractions, all with good result; 55 iridectomies, 22 for optical purposes.

In the Presb. Eye and Ear Hospital (CHISOLM) at Baltimore (5) 2,550 diseases of the eye were treated in the year 1881, as follows: 397 cases of diseases of the lids, 133 of the muscles and nerves, 109 of the lachrymal apparatus, 781 of the conjunctiva, 475 of the cornea and sclera, 221 of the iris, 68 of the choroid (including glaucoma), 105 of the retina and the optic nerve, 24 of the vitreous and anterior chamber, 167 of the lens, 44 of the globe, 310 cases of errors of refraction and accommodation. 461 operations were performed: 62 extractions, 52 according to von Graefe; 33 iridectomies, 58 operations on the cornea, 82 upon the lids, 32 upon the conjunctiva, 106 squint-operations, 72 upon the lachrymal apparatus. In the last four years there were operated: 218 cataracts, 381 tenotomies, 272 operations upon the lachrymal apparatus, 71 enucleations, 94 iridectomies, 76 removals of pterygium, 377 operations on the lids, 14 optico-ciliary neurotomies.

SELLINGO (7) treated over 63 % of diseases of the conjunctiva and cornea, 7 % errors of refraction and accommodation, 11 extractions with small flap downward; no failure.

DANTONE,

SCHLEICH (8) examined in all 578 myopes, of whom 410 belonged to the male and 168 to the female sex, *i. e.*, 70 % men and 29.1 % women. Among the male sex the ages were as follows: 7 up to 10 years old, 137 from 10-20, 134

from 21-30, 39 from 31-40, 40 from 41-50, 26 from 51-60, 24 from 61-70, and 3 over 70. The youngest male myope was 6 years old. Many children under five and newborn children were examined under atropine, but myopia was never found. There was almost always hypermetropia of a low degree; 45.2 % of the women and 30.2 % of the men belonged to the rural population. Anisometropia was frequently observed. High degrees of myopia are much rarer than low ones, though the former are comparatively more frequent among women. The proportion of myopes among the older women is much greater than among the younger. The degree of myopia increases with age. Among 738 myopic eyes, 329, *i. e.*, 44.5 % had normal vision, and 409, *i. e.*, 55 %, $V < 1$. In low degrees of myopia V is about normal, but it decreases as the degree of myopia increases, which is also the case with advancing years. In 87.7 % changes at the papilla are visible with the ophthalmoscope, due to atrophy or displacement of the pigmented epithelium and the choroid. These changes are most frequent at the temporal border of the papilla, and rarest at the upper edge. These alterations are called crescents, and a certain relation exists between their shape and that of the papilla. The extent, size, and kind of the crescent generally bear a certain relation to the age, the state of refraction, the power of vision, and the frequency of complications. The breadth and extent of the crescent increase with age. As the crescent increases, V decreases. In 41 cases, *i. e.*, 7 %, there was concomitant squint; of these 31, — 5.3 %, divergent, and 10, — 1.7 %, convergent squint. In 15 cases of divergent squint there was isometropia, in 14 anisometropia. Latent disturbances of the muscular equilibrium were much more frequent than these manifest forms of squint. The most common form was latent divergence near by. 244 eyes were treated for some length of time with atropine, 173 of which, *i. e.*, 70.1 %, showed a primary reduction of the state of refraction in consequence. 75 eyes could be examined again after some length of time, 25 of which, *i. e.*, 33 %, showed no increase of the primary reduction of the state of refraction. It showed, therefore, that the extensive use of atropine is of the greatest therapeutical importance in progressive myopia. Various complications were found. There were opacities of the cornea and anomalies of its shape, as keratoconus, keratectasia. On the iris were observed iritic remnants, irideremia, coloboma, pupillary membrane. In the lens: tremulousness in 4 cases; in 12, anterior or posterior polar cataract; in 22, zonular cataract. In 75 cases progressive cataract was observed. One of the most frequent complications of myopia is liquefaction and opacities of the vitreous, especially in higher degrees. The most important changes are those in the region of the posterior pole. In 7.4 % of the men and 9 % of the women such complications were observed, consisting in exudation and hemorrhage, or remnants of such processes. Detachment of the retina occurred in 2.6 %. In 2.9 % there were inflammatory affections of the choroid, or residues of such. Albinism and coloboma of the choroid were also observed.

From 1874 to 1881, 1,460 persons with 1,547 senile cataracts were operated at ARLT's (9) clinic by peripheric linear extraction; 1,210 were mature, 232 hypermature, 67 immature, 38 complicated. In 33 cases there was hemorrhage during the operation; in 183 the expulsion of the lens was difficult; in 122 vitreous escaped; 1,277 cases were operated without accident; in 117 cases parts of the lens remained in the eye; in 139 there was iritis, in 22 traumatic keratitis, in

10 panophthalmitis. In 1,138 cases the course of healing was normal. Secondary operations were necessary: in 19 cases iridectomy, in 11 iridotomy, in 84 dissection. 1,409 cases were cured, *i. e.*, 91.23 %; 33 were lost, *i. e.*, 2.06 %. A doubtful result with chances of improvement by an after-operation was obtained in 92 cases, or 6.44 %. In the last eight years 39 flap-extractions were performed, with recovery in 74.4 %, loss in 12.8 %, and a doubtful result in 12.8 %. V at time of discharge — $\frac{5}{8}$ in 10 cases, in 22 — $\frac{5}{8}$, in 87 — $\frac{5}{8}$, in 205 — $\frac{5}{8}$, in 305 — $\frac{5}{8}$, in 303 — $\frac{5}{8}$, in 179 — $\frac{5}{8}$; in 96 fingers were counted at 3-6 metres, in 50 only at 1-3 metres.

SMITH (10) reports upon 1,780 cases of eye-diseases and 143 operations: 10 extractions according to Graefe, 14 enucleations, 39 operations upon the iris, 16 tenotomies. Detachment of the retina was successfully treated with pilocarpine. BURNETT.

WICHERKIEWICZ (12) treated 2,343 patients and performed 329 operations in 1881; among the latter there were 60 cataract-operations, of which 15 were done by simple linear extraction, 27 by modified linear extraction according to Graefe (with two moderately good results and one failure); 16 lenses were extracted within the capsule with two moderately good results; 62 iridectomies, 20 squint-operations, 1 sclerotomy, 1 optico-ciliary neurotomy. Besides these statistics there are also reports of cases, for instance: chlorosarcoma, rupture of the retina; traumatic amblyopia; lachrymal fistula, and necrosis of the nasal process of the superior maxillary bone; scleritis; myopia; glaucoma under compressive bandage; a rare form of keratitis; foreign body in the eye; general remarks on operations; iodoform.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

a.—GENERAL PATHOLOGY AND DIAGNOSIS.

1. ALBINO. Tavole per le prove ottiche in oculistica precedute da alcune riflessioni sulle scale tipografiche. Napoli, 1882. 2d ed. Test types according to Snellen.
2. AYRES. The pathology of sympathetic ophthalmia. These ARCHIVES, vol x, No. 3.
3. BERRY, G. A. On a practical test for the color-sense. *Ophthal. Rev.*, May, 1882, p. 179.
4. CABALLERO. De la oftalmometrologia, sus procedimientos y aplicaciones. Capit. iii. Coreometria. Determinacion de la figura y dimensiones de la pupila. *Revista espec. de oftalm.*, April, 1882.
5. FALCHI. Tuberculosi dell' occhio per inoculazione. *Rev. di Ottalm.*, vol. xl, 2 and 3, and *Giorn. d. R. Accad. di Med. di Torino*, April, 1882.
6. GOLDZIEHER. Perimetry. *Real-Encyclopädie*, vol. x. Nothing new.
7. HOSCH. The field of vision and its measurement. *Correspondenzblatt für schweiz. Aerzte*, 1882, No. 8. Nothing new.
8. Contribution à l'ophthalmometrie. *Ann. d' oc.*, May, June.
9. JULES. Improved ophthalmoscope for refraction. *Lancet*, No. 20.
10. KRAUSE. The micrococci of blenn. neonat. *Centralbl. f. pract. Augenheilk.*

11. KRÜCKOW. Test types to determine the power of vision. Moscow, 1882. Russian.

12. SCHUCHARDT. Vaccinated tuberculosis of the eye, and its connection with general vaccinated tuberculosis. *Phys. Soc. at Breslau*, June 11, 1881. *Breslauer aerztl. Zeitschr.*, 1882, Nos. 9 and 10.

13. SNELLEN. Optotypen, tot bepaling der Gesichtscherpte. Utrecht, 1882. A new Dutch edition of these excellent test types.

14. DE WECKER. La cicatrice à filtration. *Ann. d'ocul.*, March-April.

According to AYRES (2), the sympathetic irritation may be transmitted either through the optic nerve (optic neuritis) or through the ciliary nerves (cyclitis).

BERRY, G. A., (3) desires to draw attention to the importance of testing the light-sense, and points out the possibility of its value as an aid in diagnosis. He claims for his instrument, facility of manipulation, economy of time, that ordinary daylight is sufficient for its use, and, lastly, that it furnishes data which admit of comparison. The instrument consists of a hollow prism which is filled with finely divided Indian ink, suspended in water, to which is added a little glycerine and carbolic acid. A black screen with a slit moves in front of the prism, and along the top of the latter is a scale marking in millimetres the thickness of the fluid. The density of the mixture is determined by the fact, that on looking through the thickest end of the prism the normal visual acuteness is reduced $\frac{1}{100}$ or thereabouts. In using the instrument the observer first adjusts the slit opposite the portion of the fluid sufficiently dense to allow the smallest amount of light to pass with which he retains his full vision. The visual acuteness of the patient is then taken for the same position and noted, and if it is below the acuity obtained by the ordinary examination in a good light, the screen is moved along toward the apex of the prism to the position which just admits of his full vision. FITZGERALD.

FALCHI (5) reports on seventeen experiments upon the transmission of tuberculosis by vaccination, partly with bovine, partly with human, tuberculous substance. The former was used in eleven rabbits, and was introduced in eight cases by paracentesis into both the cornea and anterior chamber, in two only into the cornea, and in two through the sclera into the vitreous. After inoculation into the cornea and anterior chamber, not the iris was the first to be affected, as Cohnheim observed, but the sclerotic, the cornea, the ciliary processes, and the anterior section of the choroid and retina (8 to 10 days of incubation), and then the iris (after 17 days).

The eye in toto and other organs became infected forty-three days after inoculation. In regard to the point of introduction the tuberculous infiltration passed the equator but once when inoculated into the anterior chamber, though the animals became completely cachectic; but when the tuberculous substance was introduced into the vitreous, the disease rapidly spread toward the anterior part of the globe.

The tubercle-nodules and giant-cells of the cornea are embedded in thickened connective tissue, from which the giant-cells develop. The tubercle-nodules of the cornea undergo caseous degeneration.

In five of the seven cases of vaccination with human tuberculous substance it was introduced into the cornea and anterior chamber, once into the cornea

only, and once into the vitreous. The cases were observed for four months and twenty-four days. The results were the same as with bovine vaccine, though the general affection of the eye and other organs did not set in until seventy-four days later. The author concludes that the two tuberculous substances are identical, and therefore equally infectious.

It may be mentioned that in opposition to Cohnheim, the author saw an increase in the intensity of the symptoms in proportion to the quantity of tuberculous substance introduced. When only a small quantity was introduced into the vitreous, the infection spread but slowly from the retina and choroid; but when a large quantity was taken, violent panophthalmitis set in.

In another paper (*Giorn. d. R. Accad. di Med. di Torino*, Apr.) FALCHI describes two cases of tuberculosis in the human eye. In one the disease started from the retina and choroid, and spread into the vitreous, the ciliary processes, and the inner layers of the choroid; in the other it originated in the iris and ciliary body.

DANTONE.

(8) General remarks upon astigmatism and a discussion of the ophthalmometer of JAVAL-SCHJÖTZ. In young persons (up to fifty) an astigmatic accommodation of the lens is frequently found, which only disappears after the energetic and continued use of mydriatics. As the astigmatism of the lens frequently corrects that of the cornea, young patients are sometimes deprived of this advantage by correcting the total astigmatism. In the ophthalmometer of Javal-Schjötz Javal has attached a scale to the metallic arch upon which the objects move whose images are to be reflected from the cornea, which directly gives the astigmatism in dioptries.

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(10) A negative result was obtained in various animals from vaccination with pure blennorrhœic secretion or cultivated material. The micrococci of blennorrhœa are attached to each other in the secretion in shape of a double bun, which form they generally retain when cultivated. Their size varies, however, under such circumstances. When carefully cultivated the color of the micrococci is yellowish gray. They grow very slowly, and advance in form of a thin film in every direction from the point of vaccination. The surface presents a moist appearance.

The local effect of the tuberculous infection (12) never failed entirely in the rabbit; it could be observed in at least one eye. The character of the material used was the reason why the vaccinated tuberculosis did not appear in its pure form, the operative procedure being followed by caseous panophthalmitis. In the majority of animals, however, the tuberculosis remained purely local, and confined to the eye. V. No. 76 of the last report. *Arch. f. Augenheilk.*, vol. xi, p. 406.

According to WECKER (14), the efflux of the intra-ocular liquid becomes more rapid after sclerotomy, as the tissue becomes thinner over the scar.

MARCKWORT.

b.—THERAPEUTICS.

1. ABADIE and MARTIN. Letters to Warlomont on the priority of galvanopuncture in detachment of the retina. *Ann. d'ocul.*, March, April.

2. BATTESTI. De la galvano-caustique en chirurgie. *Thèse de Paris*, 1882.

3. BADAL. Leçons sur l'opération de la cataracte. *Gaz. hebdomadaire des sciences médicales de Bordeaux*, No. 20. Nothing new.
4. BOLLIET. De la greffe cutanée et de ses applications, principalement à la chirurgie oculaire. *Thèse de Paris*, 1882.
5. COSPEDAL. Neurotomia optico-ciliar para combatir una oftalmia simpática. *Rev. espec.*, April, 1882. Internat. Med. Congr. at Sevilla.
6. TALLERONI. L'uso della calamita nella chirurgia oculare. Morgagni, Feb., 1882.
7. FORT. Les derniers perfectionnements de l'opération de la cataracte. *Gaz. des hôp.*, No. 29.
8. FRÖHLICH. The change of poles in the use of the electro-magnet, and the magnetic needle as a means of diagnosis. *Klin. Monatsbl.*, April, 1882.
9. GALEZOWSKI. De la syphilis oculaire et son traitement par les injections hypodermiques mercurielles. *Rec. d'ophth.*, May, 1882, No. 5. Subcutaneous injections the best method. MARCKWORT.
10. HAASE-HERSCHEL. On stretching of the optic nerve. *Hamburg Med. Soc.*, Dec. 27, 1881; *Deutsche med. Wochenschr.*, April 29, 1882, No. 18.
11. HIRSCHBERG. Anatomical and practical remarks on the extraction of senile cataract, artificial pupil, and tattooing of the cornea. *A. f. O.*, vol. xxviii, 1.
12. HIRSCHBERG. A case of extraction with a magnet. *Berl. klin. Wochenschr.*, 1882, No. 21.
13. MAKLAKOFF. La sphinctérectomie et le sphinctérectome. *Arch. d'ophth.*, vol. ii, 3.
14. OSIO. Nuevo metodo para la operacion del estafiloma opaco total de la córnea. *La oftalm. prdct.*, May.
15. PAMARD. Elongation des deux nerfs optiques. *Soc. de biol.*, April 12, 1882. *Gaz. méd. de Paris*, No. 16; *Gaz. des hôp.*, No. 44.
16. DE LA PEÑA. Neurotomia optico-ciliar para combatir una oftalmia simpática. *La oftalm. prdct.*, April and May.
17. DE LA PEÑA. Tratamiento consecutivo à la extraccion de la catarata. *La oftalm. prdct.*, May.
18. DE LA PEÑA. Operaciones consecutivos à la extraccion de la catarata. *La oftalm. prdct.*, June.
19. RÄHLMANN. The optical effect of hyperbolic lenses in keratoconus and irregular astigmatism, and their use for glasses. *Klin. Monatsbl.*, April.
20. ROMIÉE. De l'opération de la cataracte. *Ann. de la soc. méd.-chir. de Liège*, May, 1882.

FRÖHLICH (8) declares that in strong electro-magnets it is unnecessary to change the poles. A delicate electro-magnetic needle, carefully employed, indicates the presence of even small pieces of iron and steel within the eye. It is advisable to make the foreign body magnetic by stroking the sclera before the needle is brought into use. Great proximity of the foreign body can be diagnosed with certainty from the character of the vibrations.

In order to stretch the optic nerve, HAASE and HERSCHEL (10) make an incision into the conjunctiva about 2 *cm.* long between the internal and inferior recti; the globe is then well rotated outward by means of a squint-hook inserted under the internal rectus. A hook whose curvature is adapted to the globe is then passed back and around the nerve, which is then strongly drawn forward several times. Recovery without any reaction. Up to date thirteen cases of stretching of the optic nerve are on record. In some there was a marked improvement; V increased, and in one case the field of vision was much enlarged. It is more desirable to operate at the inner than the outer side of the globe, as there are no muscles in the way, and the optic nerve can be reached more easily.

HIRSCHBERG (11) advises to cleanse the instruments before the operation in a 5 % solution of benzoate of soda. Bandage: cotton impregnated with the solution of benzoate of soda, changed twice a day and also in the evening of the day of operation (for several years the author has changed the bandage the evening of the first day). The paper ends with an anatomical description of four enucleated eyes which had been operated for cataract.

The sphincterectome (13) consists of the pincers-ciseaux and a delicate hook of silver or soft iron, which may be pushed forward between the blades of the scissors and again withdrawn by means of a narrow metal plate attached to the outer right side of the handle of the instrument. After the corneal section, which need be but small, the hook is advanced, pushed forward into the anterior chamber until it has seized the sphincter, and again withdrawn. The piece of iris thus seized then lies exactly between the branches of the scissors and is abscised. Advantages: the certainty of obtaining the shape and size of the coloboma intended, without fearing that the sphincter will remain behind, which may even be excised for itself. The painful seizure of the iris with the forceps is dispensed with. Makes assistance unnecessary. It is especially to be commended for extraction.

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It happened to PAMARD (15) while stretching the left optic nerve (bilateral atrophy and severe neuralgia), that it tore. The patient soon died. This would seem to show that the operation is not so safe as has been mentioned.

Hyperbolic lenses (19) increase the power of vision in keratoconus and extend the field of vision, V being improved both for distance and near by. The objects fixed appear considerably larger.

According to ROMÉE (20), age has no effect upon a cataract-operation. After-treatment as simple and short as possible. Before the operation the muriate of quinine is dropped into the conjunctival sac; for other purposes carbolic acid is used as a disinfectant.

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III.—INSTRUMENTS AND REMEDIES.

a.—NEW INSTRUMENTS.

1. GRAEFE. Epicritical remarks on operations for cysticercus, and description of an ophthalmoscope for localizing. *A. f. O.*, vol. xxviii, 1.
2. MAYERHAUSEN. Clinical demonstration of the angle Y. *Centralbl. f. Augenheilk.*, Apr.
3. RÖHRIG. Self-adjusting shell-plate entropium forceps. *Buffalo Med. and Surg. Journ.*, vol. xxi, 9.

b.—REMEDIES.

1. GALEZOWSKI. Du spray phénique comme moyen préventif et curatif de la kerato-iritis suppurative dans l'extraction de cataracte. *Rec. d'ophth.*, No. 5, May. Is absolutely necessary, both during the operation and at every change of the bandage. MARCKWORT.

2. MC KEOWN. Observations on pilocarpine. *Dublin Journ.*, May.

3. MANDELBAUM. Sur l'action de cyanure de mercure dans les affections oculaires syphilitiques. *Rev. de thérap. méd.-chir.*, vol. xi. Has an excellent effect.

4. OLIVER, C. A. The comparative action of sulphate of daturia and of sulphate of hyoscyamia upon the iris and ciliary muscle. *Amer. Journ. Med. Scien.*, July, 1882.

5. REICH. Note upon the use of resorcin in ocular affections. *Minutes of the Kans. Med. Soc.*, Nos. 11 and 12.

6. SCHÖLER. Fluoresceine and its importance in investigating the osmose of liquids in the eye. *Berlin phys. Soc.*, Feb. 24, 1882; *Arch. f. Anat. und Phys. Physiol.*, parts 1 and 2. v. last rep., No. 126.

7. VOGL. Physostigma venenosum. *Real-Encyclop.*, vol. x.

MC KEOWN (2) used pilocarpine, partly with good effect, in detachment of the retina, optic neuritis, scleritis, and corneo-scleritis.

OLIVER'S (4) conclusions are as follows: While $\frac{1}{40}$ to $\frac{1}{80}$ of a grain of either sulphate of daturia or sulphate of hyoscyamia is sufficient to paralyze the accommodation of an emmetropic or healthy ametropic eye, it is not sufficient for an unhealthy ametropic eye, nor is one instillation sufficient for the determination of refraction in asthenopic cases. Maximum dilatation of pupil is produced by such a dose of either drug, but the total paralysis produced by the daturia is attained later and passes away sooner than that caused by the hyoscyamia; the mydriasis of a single instillation of the daturia is not so quickly attained and passes away sooner than that of hyoscyamia. The full action of the daturia remains intact for a shorter time than that of hyoscyamia—the time being about double. The use of a neutral salt prevents the irritant and astringent action of the drugs on the conjunctiva.

The constitutional effects of a single instillation of daturia are very slight, while those of hyoscyamia are sometimes grave. BURNETT.

IV.—ANATOMY.

a.—GENERAL ANATOMY.

1. DUJARDIN. Un cas de persistance de la membrane pupillaire. *Journ. des sc. méd. de Lille*, 1882.

2. FANO. Microphthalmus unilateral. *Journ. d'oculist*, No. 109.

3. GEGENBAUR. Further remarks on the pars facialis of the human lachrymal bone. *Morpholog. Jahrbuch*, vol. vii.

4. GRIFFITH. Congenital coloboma of the iris of the right eye, with microphthalmus on the opposite side. *Ophth. Rev.*, May.

5. MARCHI. Sugli organi terminali (nervosi corpi Golgi) nei tendini dei muscoli motori del bulbo oculare. *Arch. per le scienze méd.*, vol. v, 15. *Arch. f. Opth.*, vol. xxviii, 1.

6. MAYERHAUSEN. Direct inheritance of double microphthalmus. *Centralbl. f. Augenheilk.* Microphthalmus through three generations.

7. RANIER. Étude sur l'occlusion des paupières chez l'embryon. *Thèse de Paris*, 1882.

8. RUMSCHEWITSCH. Coloboma oculi, membrana pupillaris persistens, polycoria. *Centralbl. f. Augenheilk.*, May.

9. RUMSCHEWITSCH. A case of preserved embryonic pupillary membrane. *Centralbl. f. Augenheilk.*, May.

10. RUMSZEWICH. Description of five cases of membr. pupillaris perseverans. *Pamiętnik Towarzystwa Lekark.—Warszawskiego*, vol. lxxviii, pp. 49-62.

11. TARANETZKY. Anatomy and development of cyclopia in man, and remarks on general malformations. *Med. Bibliothek*, April, 1882.

TARANETZKY (11) writes the following from his own observations, as well as from the literature of the subject (Cyclopia):

The head is of the hydrocephalic type. The remains of the nose, when present, form a snout-like projection over the eye (on the glabella). Eyebrows higher, and confluent when nose is wanting. Large round orbit, divided into two parts, surrounded by lids. Latter absent in a few cases, where the eyeball may either be wanting or present. (Anophthalmia cyclopica vera et spuria.)

Generally three lids with eyelashes (one composed of two upper lids and two separate under lids); less frequent, two upper and two lower, and sometimes one upper and one under lid, or one circular, or five lids (three upper and two under lids).

Generally two lachrymal points, varying from one to four (according to the number of lids); canaliculi end blind, since there is no nasal cavity. Sometimes a third lid; sometimes two caruncles.

Of the bones of the skull, the os occipit., basilar, and ossa parietalia are normal in structure. Of the temporal bones, the bones of the inner ear, are generally abnormal; sometimes the drum-membrane and ossicles are wanting. Sphenoid bone always of slight development, especially the body and the smaller wings; the latter are grown together, and when there is an optic nerve, they form a foramen opticum.

The superior maxillary shows the greatest malformation of the bones of the face; they are grown together, remaining separate only on the facial and orbital surfaces, and form the largest part of the floor of the orbit. The processus frontales wanting.

The form of the cyclopic orbit is easily understood if we consider it as formed of both orbits together. The most pronounced defects of the brain are found in the anterior part, which is formed from the anterior cerebral vesicle, or those parts which are anterior to the cerebral peduncles. The "inter-brain" (intermediary brain, thalamencephalon) is less changed, and forms a solid mass depending upon the union of the optic thalami. If the cerebral cortex is insufficiently developed, this mass lies free in the cranial cavity. The under surface of the optic thalamus forms the whole base of the brain; on the under

surface there are two prominences: the first is the undivided corpora mamillaria; the second, the tuber ciner., infundibulum, and hypophysis cerebri.

Anterior to both, and from the anterior end of the combined optic thalami, the optic nerve passes out, generally a single trunk. Very seldom are there two tracts, which afterward coalesce into one. Frequently the optic nerve is wanting. Anterior to this the optic thalamus is confluent with the frontal lobes. The upper surface of the optic thal. is confluent with the posterior inferior part of the frontal lobe. The upper surface of the optic thalamus mass is always divided into two parts by a groove. The corpora geniculata are wanting. Commissura anterior and mollis not developed.

Only the anterior part of the optic thal. stands in connection with the anterior part of the brain; it is connected either by a rudimentary corpus striatum, or if this is wanting, by a transition of the corona radiata into the substance of the cerebral cortex.

The form and shape of the anterior part of the brain varies very much, according to the quantity of cerebral liquid, and has only rarely the appearance of cerebral hemispheres. The upper convexity of the anterior brain is flattened, the large sagittal suture is absent, also the convolutions and transverse fissures. The occipital parts of the combined hemisphere, so to speak, are sometimes wanting.

On account of the great pressure of the pial fluid symptoms of inflammation of the meninges are demonstrable.

According to the form and development of cyclopic eyes he distinguishes three groups with possible intermediate conditions.

1. There are only irregular remains of an eye in the common orbit: anophthalmia cyclopica. This form is rare. 2. One eye, with evident signs of having been formed from two eyes, presents different varieties. The most frequent form of this is: oval globes, one optic nerve, a single sclera, choroid and retina, a double cornea, anterior chamber, pupil, lens, and capsule. Very seldom we find the anterior part single, and the posterior double, with double optic nerve, which becomes single further back. 3. One eye, without any external signs of division (sometimes internal division, as the lens); optic nerve single, sometimes disappearing at the posterior orbital walls; in this case the optic foramen and cerebral portion of the nerve are also wanting, but the retina is normal. He concludes that the cerebral portion of the nerve has been destroyed after having been formed. The idea of Magendie, that the retina can develop independently of the optic nerve is untenable.

The development of cyclopia is the result of an abnormal development of the whole anterior part of the head of the embryo (the anterior end of the medullary tube and the part of the ectoderma connected with it) and is not the result of pathological changes in any of the individual organs. The pathological process has its origin in the forebrain and interbrain, and those parts which form the anterior wall of the anterior cerebral vesicle (primitive frontal region of the skull).

The causes of the malformation, according to the author, are twofold: 1, pressure from without (not hydrocephalic, which is only of secondary importance) caused by a too narrow anterior amnios-fold, the so-called skull-cap; and 2, inflammatory processes, the remains of which can be recognized in the membranes of the cerebrum, and also in the bony and soft parts of the head and the

face. The inflammation in that part of the pia which covers the forebrain, interbrain, and midbrain is more pronounced, and on account of this the large ensiform process is not formed, and the division of the hemispheres does not take place. The forebrain is thereby rendered flat. In the interbrain the two sides are made to coalesce by pressure; and in the midbrain the pressure hinders the regular separation.

The inflammatory process in the lateral portions of the anterior cerebral vesicle (end of first week) can prevent the formation of the ocular vesicle, or, working together with intracranial pressure, can destroy the ocular vesicle if it has been already formed. This would be the first form of cyclopia-anophthalmia. In the third form of cyclopia, the two ocular vesicles are forced into one by pressure, after they have been formed (beginning of second week). There will then be only one ocular vesicle with one pedicle, and by a further abnormal development, one eyeball, and one nerve, which will come from the under side of the optic thalamus. In the second form of cyclopia the two ocular vesicles and their pedicles were formed at the base of the brain, but later coalesced. The formation of the lenses and other parts has already begun before this. By the influence of pressure either the anterior or the posterior (this more often) parts may grow together.

All causes which can produce cyclopia exert their influence in the human embryo during the second and third weeks.

The diseases of the embryo may have their origin in psychical or physical influences on the organism of the mother; also congenital morbid processes in the parents of the child.

HIRSCHMANN.

b.—RETINA.

1. RANVIER. Anatomie de la rétine. *Arch. d'ophth.*, April.
2. RENAUT. Sur la rétine du type juxta-épendymaire. *Rev. génér. d'ophth.*, May, June.
3. SPINA. Observations on the different types of connective tissue. *Wiener med. Blätter*, No. 23. The two finely granular parts of the retina seem to be made up of delicate meshes, which are capable of motion.

RANVIER (1) considers that there are eleven layers of the retina. Pigment-epithelium, rods and cones, limitans ext., nuclei and cells of the cones (visual cells), basilar plexus (with basal cells in some animals), bipolar and unipolar cell layer, cerebral plexus, layer of multipolar cells, layer of optic-nerve fibres, limitans interna. He gives also the anatomical structure of the different layers, the connective tissue, and blood-vessels of man, and several other vertebrata and batrachia. Method of preparation: Put the eye of a triton in a bottle of osmic acid for half an hour; then open the eye in its equatorial plane and place it in dilute alcohol for twenty-four hours. Then color with picro-carmin, and later harden it further with 1% solut. of osmic acid.

V. MITTELSTÄDT.

c.—OPTIC NERVE.

1. BERGER. On the finer structure of the optic nerve. *A. f. A.*, vol. xi, 3.
2. FUCHS. Contribution to the knowledge of congenital anomalies of the optic nerve. *A. f. Ophth.*, xxviii, 1.

3. SAMELSOHN. On the anatomy and nosology of retro-bulbar neuritis. Course of the macula fibres in the optic nerve. *A. f. Ophth.*, vol. xxxviii, 1.

4. STILLING, J. Examination of the structure of the central optic organs. First part: chiasma and optic tract, with ten lithographic plates. Kassel and Berlin, 1882.

(1) The anterior layers of the bands of the lamina cribrosa come from the choroid; they are somewhat more delicate than those which come from the sclera. Both sets stand in close connection. In the vicinity of the edge of the optic nerve those which come from the choroid have isolated pigment cells between them in the adult. He does not agree with Kuhnt's idea, that those which come from the choroid are to be looked upon only as adventitial fibres of the blood-vessels.

In some vertebrates the choroidal part of the cribriform membrane shows similar conditions.

FUCHS (2) has frequently found **small crescents on the lower border of the optic disc**. They are congenital, being an analogue to the coloboma of the inner membranes. They are generally associated with myopia and impairment of vision.

According to SAMELSOHN (3) the **macula fibres** are, at the optic canal, situated exactly in the axis of the nerve trunk, surrounded by a peripheric uniform zone of nerve bundles, which are subservient to the eccentric vision. Shortly after the exit of the optic nerve from the osseous canal, the above axial situation changes so that the corresponding fibres pass gradually over to the temporal side. The bundle of fibres is cylindrical in shape until it reaches the temporal edge of the nerve, immediately before the entrance of the central vessels, where it suddenly changes its form. In the shape of a wedge, the point of which is turned toward the central vessels, it reaches the papilla, from which it radiates into the retina in the well-known manner described by J. Michel.

STILLING (4) publishes a very elaborate treatise which is of the greatest importance for the knowledge of the **central optical organs**. It is based throughout on original investigations, and is distinguished most favorably from the current literature by a conscientious consideration of the historical part. Stilling's work demonstrates that historical knowledge is not indispensable even for purely practical researches in which the anatomical knife and the microscope are used.

The **chiasm**, according to Stilling, is formed of four different fascicles of nerve fibres, three of which constitute the optic nerve proper; the fourth has to be regarded as a commissure of the central organs, in which the optic-nerve fibres end. These four fascicles are: the uncrossed fascicles of the tract and of the optic nerve of the same side; the crossed fascicles; the anterior arched commissure; the posterior arched commissure. The uncrossed fascicles are the most numerous; next, the two commissural; and least, the crossed. The uncrossed bundles encompass the cord-like crossed bundles laterally like a trough, which is thickest on the side, gradually thinning out toward the middle line, yet constituting considerable layers on the upper and lower surfaces of the chiasm. Apart from the commissura arcuata of Hannover, the chiasm is almost completely enclosed by uncrossed fibres, tract fibres proper, and fibres derived from

the base of the brain. The anterior commissure, which unites the two retinæ with each other, is situated in the anterior angle and on the dorsal surface of the chiasm. A small part of the fibres of the posterior commissure is situated crest-like in the posterior angle of the chiasm, but the greater part is situated on the lower surface of the chiasm, reaching as far as its anterior edge.

The tuber cinereum has a double relation to the optic nerves and tracts. It furnishes them direct, uncrossed fibres, and has, besides, the significance of a ganglion inserted into their course. The anterior perforated substance also sends to the chiasm uncrossed fibres passing on its dorsal surface.

In its centripetal direction from the chiasm the optic tract becomes broader and flatter, dividing itself, in about the middle of its course, into two, rarely three, branches, subject, however, to variations. One of the two principal divisions, marked off by a more or less shallow incision, goes to the outer, the other to the inner, geniculate body. Between the two branches which go to the corpora geniculata a third variously developed one is wedged in, the fibres of which are directly continued into the short cord, the brachium conjunctivum anticum apparently connecting the thalamus with the upper corpus quadrigeminum. The surface of the optic thalamus and the corpora quadrigemina is covered by a white stratum of nerve fibres which is in direct connection with the optic tract and may be regarded as the analogue of the *tectum opticum* in certain animals. The three branches of the tract mentioned above participate in the formation of this tectum. The first branch, connected with the outer geniculate body, sends fibres to the tectum of the thalamus and the inner surface of the opt. thal., which forms part of the wall of the third ventricle. The middle branch sends but a few fibres to the tectum of the thalamus, but many to the tectum of the anterior corpora quadrigemina. The third branch sends fibres to the tectum of both corpora quadrigemina, chiefly to the posterior corp. quadrig. The outer corpus geniculatum is bordered, covered, and partially pervaded by fibres of the tractus. A part of the fibres ends in the cells of the corpus geniculatum; the greater part, however, passes through and unites again on the side of the thalamus. The outer corpus geniculatum can, therefore, by no means be regarded as the nucleus of origin of the tract, but only as a ganglion inserted in its course. The same holds for the inner corpus geniculatum; it is likewise penetrated by tract fibres which partially end in it, partially pass through it.

The third division of the tract, the *brachium conjunctivum anticum*, splits at the anterior corp. quadrig. into a superficial and a deep branch. The superficial contains the fibres going to the tectum of the superior corpus quadrigeminum; a part of these fibres passes around the edge of the corp. quadr. into the furrow between both corpora quad., and loses itself in the frenulum veli medullaris superioris. This branch gives off a small branch to the inner surface of the thalamus, entering into the taenia thalami optici. The two superficial branches of both tracts are connected directly with each other by commissural fibres. The deeper branch of the brachium conjunctivum anticum loses itself in the gray substance of the upper corpus quadr. The brachium conjunctivum posticum bears a double relation to the optic tract. On the one hand it connects the gray substance of the outer geniculate body with the posterior corp. quadrigeminum; on the other hand it contains a great number of fibres which pass directly from the optic tract into the posterior corpus quadrigeminum, without any interposition of gray substance. It contains not only direct

and indirect tract fibres, but also such as pass in horizontal direction to the cerebral peduncle.

The optic thalamus has a superficial and a deep-seated origin, a tectum, and fibres that enter into the gray substance in its interior. Stilling describes all these fibres accurately. We cannot follow him into all the details, but must point out his surprising discovery that a large quantity of fibres of the optic tract pass through the pes of the crus cerebri to the medulla oblongata. Stilling calls the root to which these fibres belong the *radix descendens nervi optici*. It consists essentially of two bundles leaving the tract one behind the other, viz., a stronger bundle, *radix laquearis* or *radix olivæ inferioris*, and a weaker bundle, *radix pontis*. The radix laquearis is a broad bundle turning away from the trunk of the tract at the inner-upper border of the outer geniculate body. It runs as a compact cord, somewhat longer than 2 cm., directly to the lower olivary body, in the gray substance of which a part of its fibres is lost, while another part runs along its inner surface to pass over into the decussation of the pyramids. The radix pontis leaves the tract a short distance before the radix laquearis, and descends between the external bundles of the pes of the cerebral peduncle until its fibres reach the deep-seated gray strata of the pons.

Furthermore, fibres of the optic tract go into the amygdaloid nucleus, constituting its lowest origin. Besides these, a number of tract fibres leave the tract with the bundles of the radix laquearis, but separate from them to seek new places of origin in the nucleus of the motor oculi communis and in the crus cerebelli.

As to the distribution of the tract fibres in the brain and optic nerve, the following fibres of the tract enter the brain: 1, the crossed; 2, the uncrossed; 3, the posterior arched commissural fibres. The uncrossed fibres can be followed as far as the tectum opticum of the optic thalamus, and the gray substance of the pulvinar; a large number pass through the outer geniculate body to terminate in the stratified plates of the optic thalamus. Uncrossed bundles may further be traced up to the corpora quadrigemina. Some pass over the superior surface of the outer geniculate body to the anterior corpus quadrigeminum, and some go to the brachia anticum and posticum and to the radix descendens. Crossed bundles enter into the inner and outer geniculate bodies, the anterior brachium conjunctivum, and the radix descendens.

In the optic nerve there are: 1, uncrossed fibres, situated on the outer side and on the upper and lower surfaces; 2, crossed tract fibres; 3, bundles of the commissura arcuata anterior; 4, uncrossed fibres from the tuber cinereum; 5, uncrossed bundles from the anterior perforated substance and the lamina terminalis cinerea. It is impossible accurately to separate all these kinds of fibres in the optic nerve.

d.—LENS AND VITREOUS.

1. AIBY. The canalis Petiti and the zonula Zinnii of man and the vertebrates. *Gr. Arch. f. O.*, xxvii, 1.

2. AYRES, W. C. I. The development of the eye. II. The capsule of the lens. *N. Y. Med. Journ.*, vol. xxxv, 5.

3. BECKER, v. On the anatomy of the healthy and diseased lens. *Centralb. f. Aug.*, May; *Rev. génér.*, June; *Ophth. Rev.*, Dec., 1882. Preliminary

communication. Will be reviewed in detail when the forthcoming elaborate treatise has appeared.

4. ROBINSKI, SEVERIN. Investigations on the length and arrangement of the fibres of the lens. *Centralbl. f. d. med. Wiss.*, 1882, No. 21. Preliminary notice. (The elaborate paper has since appeared in the Germ. ed. of these ARCH., Bd. xi, p. 447.)

According to AIBY (1) the hyaloid appears macroscopically and microscopically as a sharply defined membrane; it does not belong to the retina, but is a limiting membrane proper of the vitreous, which it encloses on all sides, also on its lenticular part. The canalis Petiti is only the peripheral segment of the postlental space, laterally bordered by the zonula, posteriorly by the hyaloid as far as it is not united to the capsule of the lens. The zonula is a real independent membrane, insoluble in acids, whereas the hyaloid is soluble in the same. The zonula is one of the most persistent formations of the animal body.

The length of the lens-fibres (4) in the newborn averages 2.14". No fibre passes through the entire half circumference of the lens. The fibre which starts from the anterior pole is inserted almost precisely at the junction of the outer and middle third of the corresponding posterior radius. The adjoining fibres descend, the breadth of a fibre each, from the centre, and in the same manner ascend in the corresponding radius upon the posterior surface toward the centre, until the fibres which start from the junction of the outer and middle thirds of the radius of the anterior surface reach to the posterior pole. In the adult the fibres are shorter than in the newborn, and do not reach the junction of the outer and middle thirds of the radius; but the fibres extend at least more or less than one fourth of their distance from the pole beyond the margin.

c.—COMPARATIVE ANATOMY.

1. BERGER. Contributions to the anatomy of the visual organ of fishes. *Morph. Jahrb.*, vol. viii, 1.

2. DENISSENKO. The retinal structure of the eel. *Arch. f. mikrosk. Anat.*, vol. xxi, 1.

3. DENISSENKO. The retinal structure of *Iota vulgaris* and *ophidium barbatum*. *A. f. Ophth.*, vol. xxviii, 1.

4. DEFOSSÉS. Œil du protée. *Note présentée par M. le prof. Robin à l'acad. des sciences*, June 26, 1882, No. 26.

5. HARTOC. De l'œil impair des crustacés. *Compt. rend. hebd. des séances de l'acad.*, No. 21.

6. HIRSCHBERG. The eyes of amphibia and fishes. *Read before the Physiol. Society of Berlin*, May, 1882.

7. HIRSCHBERG. Comparative ophthalmoscopy. *Arch. f. Anat. u. Physiol.*, Abth. 1 u. 2.

8. VIRCHOW. The blood-vessels of the vitreous and retina of the eel. *Morph. Jahrb.*, vol. vii.

DENISSENKO (2) is opposed to Krause, who says: "What has been described as the layer of outer granules in the retina of the eel, is only the outer portion of the inner layer of granules."

DESFOSSÉS (4) has very carefully examined the eye of proteus and has arrived at the following conclusions : the eye contains : 1, an outer membrane, which may be compared to the sclerotic, with cartilage corpuscles interspersed ; 2, a choroid, consisting of a thin capillary layer and pigmented cells, upon its inner surface a limiting membrane ; 3, a retina with optic nerve. The retina has seven layers : an epithelial-pigment layer, an outer molecular, outer granules, an inner molecular, and a layer of inner granules, ganglion cells and nerve fibres. But the eye of this animal has neither lens nor vitreous, in fact no organ of refraction.

According to HIRSCHBERG'S (7) statement the eyes of animals are mostly hypermetropic ; from the teleological stand-point it may be remarked that, if a positive accommodation by a voluntary thickening of the lens is present, the hypermetropic eye, with its short axis, is the most suitable ; since for distant vision a short axis can be adjusted by a slight relaxation of the accommodation, whilst the correction of a lengthened axis requires an artificial apparatus. He describes more accurately the ophthalmoscopic picture of different animals, as the frog, pigeon, guinea-pig, rabbit, dog, cat, horse, various fishes, etc.

V.—PHYSIOLOGY.

a.—GENERAL PHYSIOLOGY.

1. ALTMANN. On Prof. Abbe's introductory remarks to his "limits of geometrical optics." *Arch. f. Anat. u. Phys.*, 1882, vol. i.
2. BERRY. A practical test for the light-sense. *Ophth. Rev.*, vol. i, 7.
3. CHARPENTIER. Sur quelques usages du trou sténopéique. *Arch. d' Ophth.*, vol. ii, 3, and *ibid.*, by the same author : Nouvelles recherches sur la sensibilité de la rétine. Influence of illumination and size of objects upon the light- and color-sense.
4. DUMONTPPELLIER. Action du regard ou de la lumière réfléchiée des yeux de l' expérimentateur sur les yeux de l' hystérique. *Soc. de la biol.*, March 18 ; *Compt. rend. hebd. des séances de la soc. de la biol.*, No. 11.
5. FITZGERALD. Deficiency of visual acuteness in seamen. *Oph. Soc. of Great Brit.*, March 9 ; *Lancet*, No. 12 ; *Ophth. Rev.*, vol. i, 6.
6. FORBES. A new form of schematic eye. *These ARCH.*, vol. x, p. 256.
7. GIACOSA. The albuminoids of the human vitreous body. *Giornale della R. Accademia di Torino*, 1882, 1 and 2.
8. GONY. Remarques sur la vitesse de la lumière. *Compt. rend. hebd. des séances de l' acad.*, No. 19.
9. HERRMANN. The refraction of oblique rays, with special consideration of the eye. Part III. *Arch. f. d. ges. Physiol.*, vol. xxvii.
10. LEROY. Sur la théorie de l' astigmatisme. *Rev. génér.*, April.
11. MAGNUS. The influence of work upon the human eye. *Humboldt*, 1882, April.
12. MATTHIESSEN. The relations between the refractive index of the centre of the nucleus of the lens and the dimensions of the eye. *Arch. f. d. ges. Physiol.*, vol. xxvii.

13. MATTHIESSEN. The twenty cardinal points of the human eye. *Klin. Monatsbl.*, May.

14. PARENT. Comment sont réfractés les rayons tombant obliquement sur l'œil. *Rec. d'ophth.*, vol. iii, 4. They produce astigmatism; the degree of astigmatism increasing with the size of the angle of incidence.

15. PARINAUD. Du siège cérébral des images consécutives. *Compt. rend. des séances de la soc. de biol.*, No. 18.

16. POUCHET. Sur une espèce particulière d'images consécutives d'origine cérébrale. *Compt. rend. des séances de la soc. de biol.*, No. 16.

17. PREYER. The soul of the child. Observations on the mental development of man during the first years of life. *Leipzig*, 1882, vol. xii, p. 424.

18. VON REUSS. Photophobia. *Real-Encyclop.*, vol. x.

19. SAMELSOHN. Soul-blindness in man. *Berl. klin. Wochenschr.*, 1882, No. 20.

20. SCHLAGER. De l'influence de la lumière bleue sur les aliénés. *Ann. et bull. de la soc. de méd. de Gand*, 1882, June.

21. SCHUBERT. Influence of inclined letters upon the eyes of children. *Aerztl. Intelligenzblatt*, No. 21.

(3) By means of a small stenopæic opening we can determine the acuteness of vision, ametropia, and approximately its degree, and also the punct. remot. in myopia. An opening of $\frac{3}{16}$ mm. diameter with smooth margins corrects ametropia of 12 D and more, also irregular astigmatism. By removing the apparatus from the eye, the objects appear smaller in M., larger in H., in E. they are unchanged, in regular astigmatism broader or narrower in certain directions. By lateral displacement of the stenopæic hole the objects apparently move, in the opposite direction in H., in the same direction in M., in E. there is no apparent motion. The extent of the excursions corresponds to the length of the axis of the eye, resp. the degree of ametropia. In M. the motion ceases when the fixed object is placed at the punct. remot. By this means we can also ascertain whether the correcting glasses are properly chosen. v. MITTELSTÄDT.

GIACOSA (7) finds in the vitreous 0.12 % albumen; mucin in smaller quantities. Besides, there are globulin and an albuminous substance similar to the albumen of the serum of the blood.

PARINAUD (15) tries to demonstrate that the after-images have their origin not in the eye but in the brain.

PREYER (17) treats, in an excellent work, of the mental development of the child, comprising in the first chapter of the first part the development of vision. In the mature newborn the sense of light is present either immediately, or a few minutes, or, at the highest, a few hours after birth; light and darkness are distinguished. Besides, there is the function of the reflex from the optic to the oculomotor nerve; we have, therefore, a congenital double-sided reflex, since both pupils react, even when light is thrown into one only. The sensitiveness to light increases to photophobia in the newborn, soon after they awake or after they have been kept in the dark, but this disappears in the course of a few days, and they soon begin to delight in looking at bright objects.

Preyer's observations in regard to the development of the color-sense in the

child are highly interesting, and will be a valuable support to the theory of a gradual development of the color-sense in the human race, a view which has also been expressed by SOURRY (comp. color-perception in this report). What Preyer says about the development of the color-sense in the child, has been maintained by the reviewer in regard to the development of the color-sense in the human race. MAGNUS asserts that man has first perceived the long-wave colors, whilst the short-wave colors, green and blue, at that phase only caused an impression of light, *i. e.*, gray, resp. black or dark, and that the perception of blue and green has appeared at a later phase of development. To this physiological development of the color-sense corresponds also the nomenclature of colors which in all tribes thus far examined is exact for the long-wave colors, but very insufficient for the short-wave colors. If we compare these assertions of the reviewer with the results of Preyer we will hardly be able to overlook their striking coincidence. Preyer says : Of the four principal colors, yellow and red are pronounced correctly at a much earlier period than green and blue. It is indeed probable that blue and blue-green are at first not perceived as blue and blue-green, but as gray and black. Gray, no doubt, is early recognized correctly, but is often called incorrectly, because green and blue probably produce the same impression. During the second year and the first half of the third we may call the child insensible to the short-wave colors. We cannot assume that a child of two years is incapable of calling blue and green correctly on account of its inability to clearly associate the names of blue and green with distinct impressions, because yellow and red have many months before been pronounced correctly. If green and blue were perceived just as distinctly as yellow and red, there would not be the least reason to name them incorrectly and to prefer red and yellow to them under all conditions. But the child does not yet know the meaning of green and blue when it is already familiar with yellow and red.

In reference to the motions of the lids, Preyer ascertained that they can take place atypically in the first weeks ; for instance, the upper lid is raised when the eye is cast down, or one lid is dropped ; the other is raised, only when being kept open. Besides, when the look is cast upward the lid frequently is not raised with it. The closure of the lids on intense light-impressions is congenital. The so-called winking does not occur in the newborn ; only after the first three months winking occurs on the sudden approach of an object near the eye. From the time of birth, supreme satisfaction is expressed by wide open eyes, displeasure by closure and contraction of the lid.

Ocular movements are often performed combinedly and co-ordinately by the newborn in the first days ; still very frequently also one eye moves entirely independent of the other ; the rotations of the head may be diametrically opposite to the motions of the eyes, so that the absence of intention of the two movements is obvious, and their concurrence appears accidental. Preyer's observations are in favor of the assumption that the conscious visual act is of decisive influence on the regulation of the ocular movements ; that harmonious centromotor impulses are directed from the optic centre to the oculomotor, abducens, and trochlearis muscles of both eyes only after the separation of the light-impressions, and that in the beginning, before the power of vision is confirmed, the ocular motions are not associated and not co-ordinated.

Previous to the tenth day, movements of fixation of the eye do not occur ; the child may turn the head, but not the eye toward a bright object.

There seems to be a preformed connection between positions of convergence and accommodative tension. The shape of an object is not clearly recognized in the first weeks, but only its brightness. Accommodation is perfect long before the perception of distance; the child is able to see distinctly, one after the other, objects at a varying distance, without knowing any thing of the difference in the interspaces. These interspaces it learns to appreciate later. In regard to the refraction, Preyer's statements are exceedingly meagre.

According to SAMELSOHN (19), there are in man physiological as well as pathological conditions identical with Munk's soul-blindness. Soul-blindness may be demonstrated physiologically by those conditions in which, in the act of squinting, the image of the averted eye is excluded from the visual act by intentional suppression. The averted eye perceives the impressions simultaneously with the fixating eye, only the perceptions of the averted eye are not elaborated into ideas. A similar phenomenon, belonging exclusively to the domain of pathology, is furnished by the fact that in hemianopia perception of light is well preserved in the absent halves of the visual field, while no object, no matter what its size, is perceived. Samelsohn has observed two such cases.

SCHUBERT (21) states that he has found that the ordinary sloping writing alphabet is injurious to the eye of the child, rendering it myopic; therefore he pleads for the alteration of the customary handwriting. This view has been recently shown to be erroneous by Berlin and others.

b.—ACCOMMODATION.

1. AYRES, W. C. The physiology of accommodation. *New York Med. Journ.*, xxxv, 3.

2. EMMERT. Die Grösse des Gesichtsfeldes in Beziehung zur Accommodation. (The extent of the field of view in reference to accommodation.) *Archiv. f. Augenheilk.*, xi, 3.

3. JAVAL. Théorie de l'accommod. *Compt. rend. hebdomad. des séances de la soc. de biol.*, No. 16.

The historical notice of the different theories of accommodation in this paper of AYRES (1), though brief, is quite accurate. The main purpose of the paper is to account for the difference in the development of the circular and longitudinal fibres of the ciliary muscle as found in microscopical sections of various eyes. A. claims that we can almost tell the degree of M. or H. from which an eye suffered by an examination of its ciliary muscle under the microscope.

Iwanoff was the first to point out the fact, that in H. the circular fibres were more strongly developed, while in M. it was the longitudinal fibres which were in excess. He considered this due to the hypertrophy of the circular fibres in the hypermetrope from constant use. Loring, on the other hand, believed that excess of longitudinal over circular fibres in M. was due to the drawing out of the circular fibres by the elongation of the ball. Ayres seems to take a teleological view and considers the atrophy of the circular fibres a provision of nature for the protection of the myopic eye. He believes a nicer adjustment of accommodation is effected by means of the longitudinal fibres, and that this nicer ad-

justment is demanded by the myopic eye when it is called upon to use its accommodation.

The pig is the only animal which shares with man and the apes the possession of a strong circular muscle—though almost all the lower animals are hypermetropic. This fact, in conjunction with the other fact, which is admitted by Ayres, that many myopes have as strong a power of Ac. as emmetropes, as evidenced by their ability to see clearly near at hand through their correction glasses, would seem to show that nature was at least not constant in her watchfulness over the myopic eye. In fact, our observation teaches us that vigor of accommodation does not go along with any particular form of eye structure. Many emmetropes are asthenopic, and many hypermetropes are not, and in some myopes of high degree Ac. is in excess of the normal. BURNETT.

The extent of the field of view (2), when looking into the distance under the effect of atropine, is nearly the same as in distant vision without atropine. The absolute limits of the field of view are the external expression of the limit to which the light-perceiving parts of the retina can be brought forward; the relative limits of the field of view are the external expression of the limit to which these parts extend.

c.—COLOR-PERCEPTION.

1. BIRGHAM. Farbensinn und Farbenblindheit bei den Hawaïiern. (Color-sense and color-blindness in the Hawaiians.) *Ausland*, 1882, No. 17.

2. BOLL. Tesi ed ipotesi sulla percezione della luce e dei colori. *Ann. d'ott.*, xi, 2 and 3.

3. BRILL. Color-blindness from a cerebral lesion. *Chicago Med. Rev.*, April 1, 1882.

4. CARRERAS-ARAGÓ. Cuál es el modo más sencillo y exacto para la determinacion del Daltonismo. Congr. med. de Sevilla. *Rev. espec. de oftalm.*, April, 1882.

5. COHN. Ueber Farbenempfindungen bei schwacher künstlicher Beleuchtung. (On color-perceptions in faint artificial illumination.) *Archiv f. Augenheilk.*, xi, 3.

6. DONDERS. Explications sur les systèmes chromatiques. *Arch. d'ophth.*, May, June. Reply to the criticism of Giraud-Teulon.

7. EMERY. La perception entoptique de la couleur du fond de l'œil. R. acad. delle Scien., 3 série, vol. vi. *Archiv ital. de biol.*, i, 2.

8. FANO. Faculté chromatique de l'œil chez les sujets atteints d'atrophie des nerfs optiques. *Journ. d'ocul.*, No. 111.

9. GIRAUD-TEULON. Sur les systèmes chromatiques par M. Donders. *Ann. d'ocul.*, March, April. Conclusion.

10. HERING. Kritik einer Abhandlung von Donders; "Ueber Farbensysteme." *Lotus*, Bd. ii. Reprint. Prague, 1882.

11. HERMANN. Ein Beitrag zur Casuistic der Farbenblindheit. (A clinical contribution to color-blindness.) *Inaug. Dissert.*, 1882.

12. KOLBE. Untersuchungen auf Farbenblindheit in Russland. *Wratsch*, 1882, Nos. 29 and 32, Russian. Comp. also the detailed reference in *St. Petersburger Zeitung*, No. 237.

13. VON LEIXNER. *Æsthetische Studien. Die Farbe im Allgemeinen. Der Character der Hauptfarben.* (*Æsthetical studies. Color in general. The character of the chief colors.*) *Schlesische Zeitung*, April 22, 1882, No. 280. Red acts æsthetically most vividly.

14. LUBBOCK-MONTAGU. On the development of the color-sense. *The Fortnightly Review*, April, 1882.

15. MAGNUS and JEFFRIES. Color-chart for the primary education of the color-sense. May, 1882.

16. MAY, HIGGINSON, DICKINSON. Report upon the teaching of color in the public schools, presented to the Massachusetts State Board of Education by a sub-committee of members of the board. *Journal of Education.*, May 4, 1882.

17. OLIVER. Preliminary paper on the determination of a standard of color-sense for reflected color by daylight, with a graphic description of the individual limits and average results of sixteen cases. *These ARCHIVES*, xi, i.

18. PFLÜGER. *Methode zur Prüfung des Farbensinnes mit Hülfe des Farben-Contrastes.* (Method for the examination of the color-sense by the aid of color-contrast.) *Zweite wesentlich verbesserte Auflage der Tafeln zur Bestimmung der Farbenblindheit.* Berne, 1882. In French, English, and Italian.

19. ROSENSTIEHL. De l'emploi des disques tournants pour l'étude des sensations colorées. Intensité relative des couleurs. *Comptes rend. des séances de l'acad.*, No. 21.

20. SOURRY. Nouvelles recherches sur le sens des couleurs dans la série animale. *République Française*, May 30, 1882, No. 3,834.

21. SOURRY. Developpement du sens des couleurs chez l'enfant, le sauvage et le barbare. *République Française*, No. 3,862, June 27th.

BIRGHAM (1), among 394 aboriginal Kanakas, found 5 color-blind, i. e., $1\frac{1}{2}\%$; among 103 female Kanakas, none were color-blind. They often mistake the names of the colors for one another, namely, red for yellow, blue for green.

According to COHN (5), there exist in various individuals differences in the intensity of the artificial light necessary for the perception of colors; in the same way there is quite a difference in this respect between the two eyes of one person. Red, orange, yellow, with inferior degrees of illumination, are recognized as green, blue, violet. Yellow is taken for pink in faint illumination. Violet is recognized with the greatest difficulty. In certain degrees of illumination all pigments appear colorless.

HERING (10), in his criticism of Donders' paper, formulates four propositions:

1. *Donders accepts most of the fundamental doctrines of the theory of contrast colors*; for, besides white and black, according to Donders, there are only four simple colors, red, yellow, green, blue; and for these four simple colors he also postulates specific psycho-physical processes. These processes are said not to be associated with certain, correspondingly different formative elements of the brain, but to run their course in the same substance. The processes designated by Hering as dissimulation and assimilation have been assumed by Donders as dissociation and new-formation of the molecules. Then Donders, in harmony

with Hering, does not explain the complementary phenomena by the theory of fatigue, but he says: Every psycho-physical process corresponding to a perception of color provokes the process corresponding to the contrast color in proportion to its existence and persistence. 2. *Donders attempts to alter the theory of contrast colors in two points.* Herein, according to Hering's views, he becomes involved in contradictions. The first point of alteration is the following: While Hering allows but a single, quite definite perception—that of neutral gray—to correspond to that condition of the visual substance in which consumption and regeneration are in exact equilibrium and the visual substance hence remains unchanged, according to Donders the whole scale of the perceptions produced in us by moderate light corresponds to that condition. The second alteration Donders effects in Hering's theory consists in this, that while according to Hering the visual substance is capable of dissimilating and assimilating in three different ways, according to Donders one and the same molecule is able to dissimilate in five different ways. From these two points Hering seeks to deduce contradictions for Donders. 3. *Donders attempts to combine the four-color theory with the three-color theory.* According to Donders, there are in the retina peculiar morphological elements with separate conducting fibres, which correspond to the three energies, the spectral red, green, violet, the so-called fundamental colors. Fundamental, therefore, are those colors which represent single processes in the periphery. Nothing, however, prevents their provoking a twofold process in the centre and their being, therefore, composite colors. Donders accordingly distinguishes between peculiar processes in the retinal and optic-nerve fibres and between processes in the central psycho-physical substance. This combination of both theories Hering declares to be impossible, inasmuch as Helmholtz's theory does not admit of such a separation of the central and peripheral processes, but assumes that every excitation of a species of fibres in the brain directly causes the corresponding perception. 4. *Disproof of the objections raised by Donders against the theory of the contrast colors.* Refers to five objections raised by Donders against Hering's theory.

HERMANN (11) in his dissertation brings nothing but what is well known. The literary references are incomplete.

In the first part of his article, KOLBE (12) discusses the necessity for a test as well as for education of the color-sense. The examination of the color-sense hitherto customary in Russia is defective; this is proved by the statistical notes furnished to date. Thus, Dr. Höppner, among 4,601 persons examined, found 60 color-blind, but only 4 with weak color-perception. Dr. Skrebitzky even reports that he had subsequently ascertained that railway employes had deceived him in the examination; namely, officials who were conscious of their defective color-sense had substituted for themselves men with normal vision. A surprisingly high percentage of 6.08 % has been found by Ljubinski. The most valuable series of tests is that of Wyrubow at the Orel-Witebsker railway, because this investigator has used several verifying methods. Especially interesting is the result found by him, that the number of those with weak color-perception for red and green is nearly the same in the various degrees of his scale, so that in the majority of cases red- and green-blindness was probably simultaneously present. The examinations of Dohnberg, Kolbe, and Hermann

have been performed after the same plan, and therefore can be immediately compared. The percentages found by the Russian examiners are the following: Krohn, among 1,200 railway employés, 60 color-blind, or 5 %; Giluss found 20 color-blind, but unfortunately all other data are lacking; Skrebitzki, among 4,100, only 35, or 0.85 %; Höppner, among 3,100 employés, 36, or 1.16 %, and among 1,500 employés, 18, or 1.20 %; Wyrubow, among 861 employés, 42, or 4.79 %; Ljubinski, among 4,578 sailors, 278, or 6.08 %, and among 377 school-girls, only 2, or 0.53 %; Kolbe, among 1,235 women, 2, or 0.16 %, and among 2,931 male persons, 73, or 2.50 %; Dohnberg and Kolbe, among 360 midshipmen, 7, or 1.95 %; Hermann, among 1,001 pupils and students, 16, or 1.60 %. In the examination of the marine training-school, Kolbe and Dohnberg used the chromatoptometric chart of Bull, and Kolbe's color-saturating plate, with best result. In the second part of his paper, Kolbe discusses the methods of Holmgren and Stilling, which he considers equivalent and supplementing one another, and the simultaneous employment of which he therefore recommends. The quantitative determination of the color-sense is also discussed; but only Bull's chromatoptometric chart (the obligatory introduction of which he recommends) is more closely described, as well as Kolbe's color-saturating plate and Kolbe's chromatometer. (These instruments can be obtained from Schultze, instrument-maker to the university of Dorpat, and from Richter, instrument-maker, of St. Petersburg.) As to the formal side of the examination, Kolbe urgently recommends the introduction of an examining commission, consisting of specialists and superior railway officials, similar to those already established at the Bergisch-Märkische and the Main-Weser railways. The results ascertained should be entered in the books and on the service papers of every employé, and published annually—a proposition in which the reviewer heartily concurs.

According to LUBBOCK (14), if we admit the theory of evolution in general, a development of the color-sense must certainly have taken place. When and how this has happened is doubtful. He is unable to accept the explanations hitherto attempted, but can offer nothing better in their stead. Recent literature has been drawn upon but imperfectly.

(15) The chart for the education of the color-sense issued by MAGNUS has been published in an English edition by JEFFRIES. This Anglo-American chart is arranged exactly like its German prototype, only in each series of colors there is one additional tint; of each color there is a saturated tint, two lighter and two darker. A pamphlet by Jeffries is supplied with the chart. It will probably be introduced into the schools of Boston. A report to that effect is already before the Boston Board of Health (comp. No. 16).

PFLÜGER (18) recommends the excellently executed second edition of his COLOR-CHARTS with the following words: "This method of testing the color-sense has the advantage that two objective colors are not brought in comparison, but one objective and one subjective one; furthermore, that the examination may be performed by a layman equally well as by an expert, and, finally, that the examination can be made under such conditions that the examined will not be conscious that his color-sense is being tested. Besides, the charts are appropriate to the rapid detection of simulated unilateral amblyopia and amaurosis."

SOURRY (20) is altogether opposed to the view of Grant Allen that the human and the animal color-sense are identical. Sourry occupies the stand-point of Magnus, who has demonstrated such identity to be impossible; the capacity of the color-sense depends most intimately on the anatomico-optical condition of the visual organ. Corresponding to the structural peculiarities of the eye, the optical functions must likewise differ.

SOURRY (21) declares the most recent investigations of Preyer regarding the development of the infantile color-sense to be an excellent support for the theory of the gradual development of the color-sense.

NOTICE.—The continuation of the Report on the second quarter will be published, in connection with that of the third quarter, in our next number.

MISCELLANEOUS NOTES.

A CORRECTION.—By Henry S. Oppenheimer, M.D., New York. In an article in these ARCHIVES for December, 1881, on "Extraction of Chips of Iron or Steel from the Interior of the Eye," Prof. J. Hirschberg quotes a case reported by me in the *Medical Record*, N. Y., of Nov. 13, 1880, as follows:

. . . "dilated (under narcosis) the wound, introduced the magnet thrice in vain, but finally found the foreign body within the wound. Two months after extraction S. — $\frac{10}{80}$."

My report states that the foreign body entered the sclera, near the corneal margin, *down and inward*, and that an incision was made through the sclera, with a lance-knife, *as far back as practicable, on a level with the lower border of the rectus externus*. It explains that "the lips of the wound had not been held apart, and so the foreign body (about a grain in weight) had been stripped from the magnet on its exit from the wound. Two months later V — $\frac{20}{c}$."

No dilatation of any wound was mentioned. *Gruening's permanent magnet was used.*

Since the report mentioned, the patient's vision has improved greatly. The last test I made showed V — $\frac{20}{80}$ +. Field normal, with some limitation, however, corresponding to a detachment of the retina downward and outward.

I think it important to have this case reported correctly. In spite of the brilliant achievements with the magnet in this field, the following question is by no means settled: Is it advisable, or even justifiable, to introduce instruments into the vitreous chamber for the extraction of foreign bodies, the location of which cannot be accurately determined? So far this is the only case I know of which would justify an affirmative answer.

The N. Y. POLICLINIC, a (post-graduate) school of practical medicine and surgery, 214 and 216 East 34th Street, was opened Nov. 7, 1882. The course of teaching is divided into five sessions of six weeks each. Thirty-six clinical lessons—no didactic lectures—will be given on each subject during each session. E. GRÜNING and D. WEBSTER are the professors of ophthalmology; L. ELSBERG and R. C. BRANDEIS the professors of laryngology, rhinology, and otology. Dr. Jas. R. Leaming, prof. diseases of the chest, is the president of the faculty.

LOUIS AUGUSTE DESMARRES, died in Paris, August, 1882. He had a hard struggle for existence in his youth. At the age of 24 years he began his medical studies. Four years later, in 1838, he became assistant to the ophthalmic clinic of Sichel. A year later he graduated, and while practising general medicine, remained Sichel's assistant until 1844, when he opened a clinic of his own, devoting himself entirely to ophthalmology. Three years later the first edition of his celebrated text-book appeared, and soon gave him a world-wide, well-deserved reputation. The second edition of this work appeared in three volumes, from 1854 to 1858. It is one of the fundamental treatises of our specialty, excellently well written, and full of original observations in every department of practical, especially operative, ophthalmology. By this work, but perhaps still more by his clinical teaching and his example, he exerted a great influence on the development of eye surgery, in the history of which he inscribed his name on many a page. H. K.

ROBERT W. LYALL, M.D., F.R.C.S., an assistant surgeon to the Royal London Ophthalmic Hospital, died in London Oct. 2, 1882, at the early age of 33 years. Though young, he had done much that gave promise of a future of unusual activity and usefulness.

GEORGE CRITCHETT, F.R.C.S., the eminent English ophthalmologist, died in London, Nov. 1, 1882. He was born in 1817, and during the first part of his professional life was connected, in the capacity of general surgeon, with the London Hospital. He is known to the world chiefly, however, from his association with the Royal London Ophthalmic Hospital, where he began his work as a specialist early in his career. In 1876, having retired from this field in accordance with a regulation of the institution, he was called to the position of ophthalmic surgeon at the Middlesex Hospital, made vacant by the resignation of Mr. Hulke.

His published work has not been great, consisting of a series of lectures on ophthalmic surgery which appeared in the *Lancet*, and occasional contributions to the journals.

He originated the subconjunctival method of dividing the tendon in strabismus, and the method of advancement as now generally practised. He also devised the operations of iridodesis and of abscission of the ball.

As an operator he was skilful, careful, and conscientious, and his judgment was sound. Personally he was most kind and pleasant, and physicians and students who were privileged to follow the service at the great charity of Moorfields, always carried away with them a memory of the genial Critchett as the highest type of the English gentleman. S. M. B.

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Light also strikes the bottom of the pond.

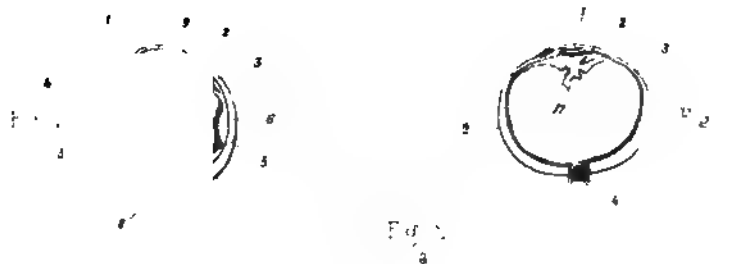
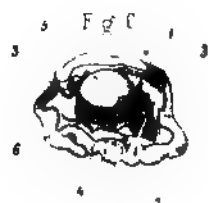
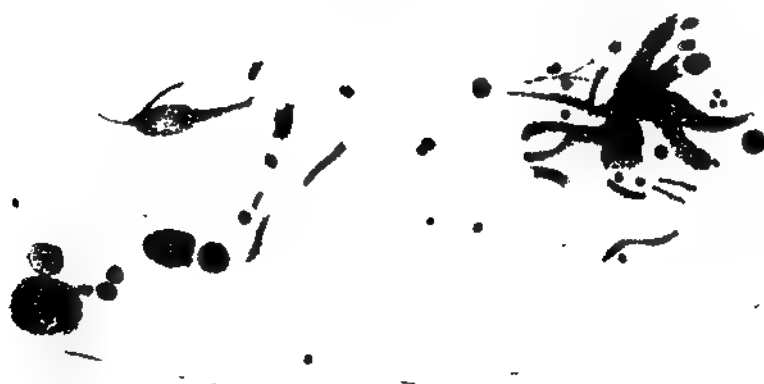


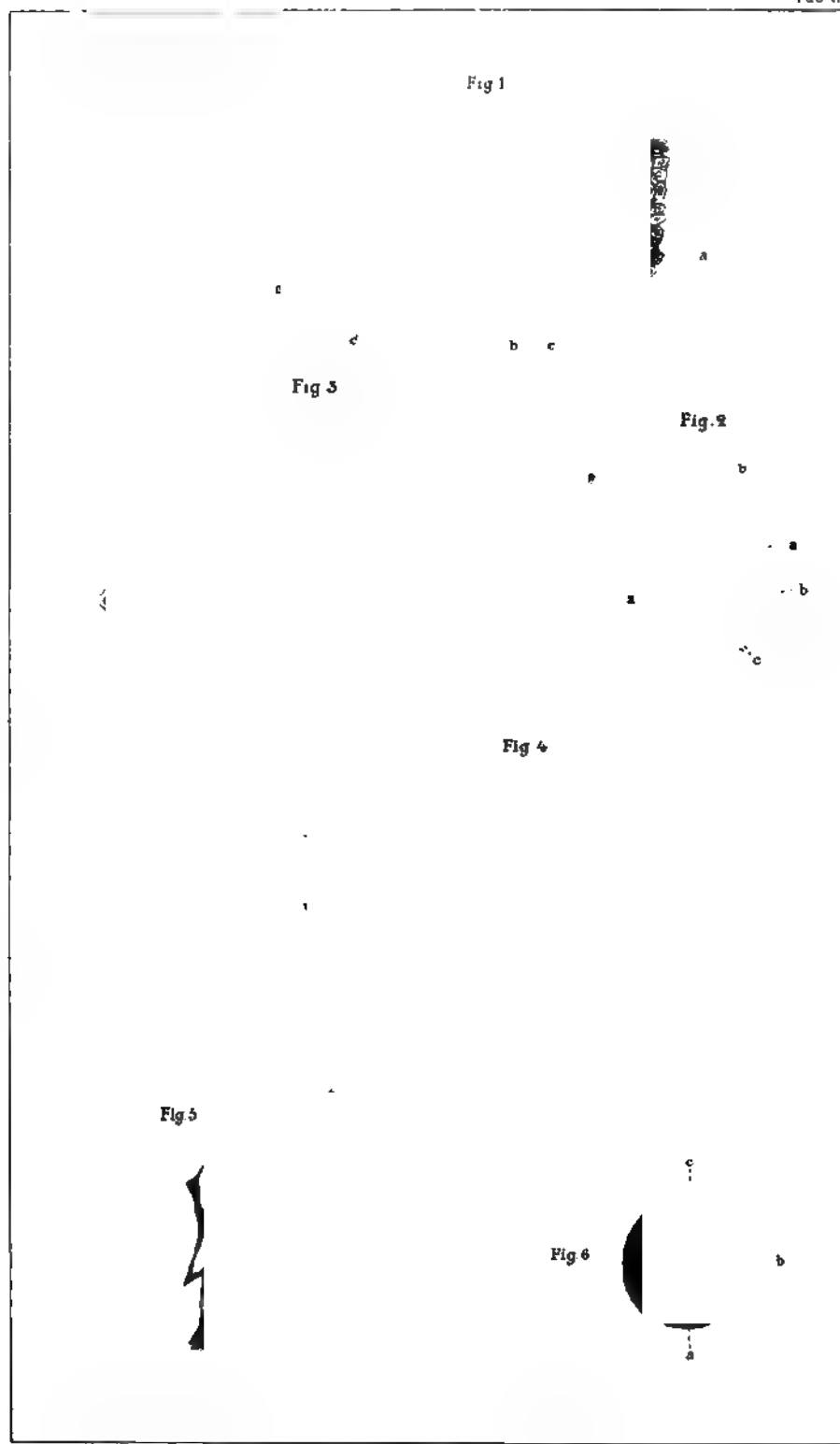
Fig 4



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Fig 1

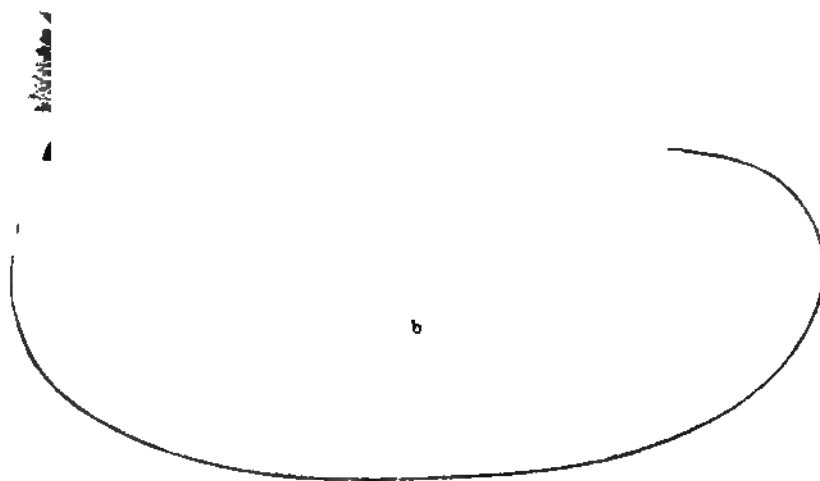


Fig 2

Fig. 2



Fig. 3



Fig. 5



Fig. 1

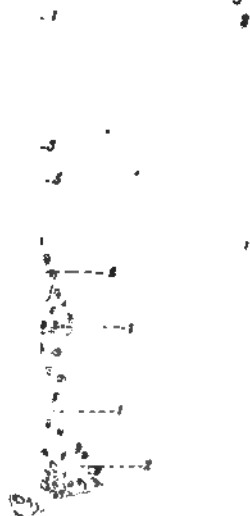


Fig. 4a

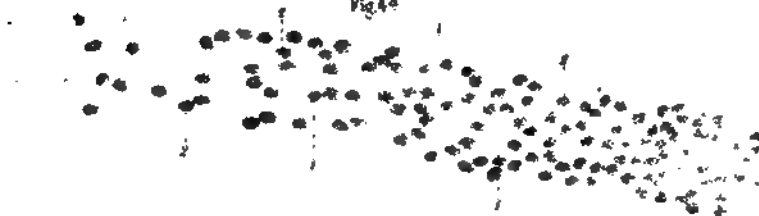


Fig. 4b

